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## **1.0 INTRODUCTION**

## 1.0 INTRODUCTION

GWF Energy LLC (GWF) submitted an Application for Certification (AFC) to the California Energy Commission (CEC) for the construction and operation of the Henrietta Peaker Project (HPP) on August 23, 2001. GWF proposes to build and operate the HPP, a nominal 91.4-megawatt (MW), simple-cycle power plant, on a seven-acre fenced site within a 20-acre parcel in an unincorporated portion of Kings County.

This AFC Supplement provides responses to the data inadequacies identified by the CEC staff in Attachment B of the CEC's September 10, 2001, Henrietta Peaker Project Data Adequacy Recommendation, as approved by the CEC on September 12, 2001.

To facilitate review by the CEC, this AFC Supplement includes the following material:

- **2.0 DATA ADEQUACY RESPONSES:** Issues are identified in the Data Adequacy Worksheets by technical area. Responses are given by technical area in the order listed in the Data Adequacy Worksheets.

## **2.0 DATA ADEQUACY RESPONSES**

**2.0 DATA ADEQUACY RESPONSES**

Please note that data adequacy responses provided in this section are arranged in the order and by the topics contained in Attachment B of the CEC's staff September 10, 2001, Henrietta Peaker Project Data Adequacy Recommendation.

## **Air Quality**



Technical Staff: Lisa Blewitt/William Walters  
Technical Senior: M. Laylon/M. Ringer  
Project Manager: Bob Eller

## 2.1 Air Quality

### Siting Regulations and Information

Appendix B (g) (8) (B): The heating value and chemical characteristics of the proposed fuels, the stack height and diameter, the exhaust velocity and temperature, the heat rate and the expected capacity factor of the proposed facility.

### Information Required to Make AFC Conform with Regulations

*Provide heating value and chemical characteristics of proposed fuel (natural gas).*

### RESPONSE 1

This information is provided in Attachment 2.1-1.

### Siting Regulations and Information

Appendix B (g) (8) (E): The emission rates of criteria pollutants from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all secondary emission sources.

### Information Required to Make AFC Conform with Regulations

*Emission estimates from ammonia and other expected regular deliveries (secondary emission sources).*

### RESPONSE 2

Exhaust emissions were calculated for delivery trucks transporting construction materials, aqueous ammonia, and other operational materials to the site. The number of truck trips per day or per month and the materials being transported are described in Section 8.10 (Traffic and Transportation), in the Henrietta Peaker Project AFC.

Emission factors were obtained from EMFAC2000, the latest California Air Resources Board mobile source emission factor model, assuming a vehicle class of light-heavy duty trucks (8,500–14,000 pounds gross vehicle weight). Emissions were calculated for the area within 10 kilometers (six miles) of the project site. As discussed in Section 8.10, trucks would travel to the HPP site from the south via State Route (SR) 43 to SR 198, from the north via SR 41 or SR 43 to SR 198, and from the east (from Tulare and Kings counties) via SR 198. The average trip distance considering these origination directions is estimated at 10 miles within the 10-kilometer radius. Estimated emissions for construction materials and operational materials are summarized in the Table in Attachment 2.1-2 titled “Estimates of Secondary Emissions from Deliveries.”

**Siting Regulations and Information**

Appendix B (g) (8) (I) (iii): A protocol for a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary emissions sources within a six mile radius which have received construction permits but are not yet operational, or are in the permitting process. The cumulative inert pollutant impact analysis should assess whether estimated emissions concentrations will cause or contribute to a violation of any ambient air quality standard.

**Information Required to Make AFC Conform with Regulations**

*Cumulative air quality modeling protocol. (The Applicant's assumption stated in Section 8.1.6 that only other power projects within 6 miles of the project need to be included in the cumulative modeling analysis is incorrect. All stationary sources meeting the required criteria must be evaluated.)*

**RESPONSE 3**

The applicant has contacted the San Joaquin Valley Air Pollution Control District (SJVAPCD) regarding potential sources that would need to be included in a cumulative modeling analysis. The request included the identification of all sources within six miles of the proposed Henrietta Peaker Project that have been permitted but are not yet operating and potential sources currently involved in the permitting process that will emit greater than five tons per year of nitrogen dioxide, carbon monoxide, and PM<sub>10</sub>. The five tons per year threshold is based on one half of the VOC and NO<sub>2</sub> offset threshold of ten tons per year. The SJVAPCD does not require that offsets be obtained for projects that emit less than ten tons per year of VOCs and NO<sub>2</sub>. The SJVAPCD identified no sources meeting these criteria (see Attachment 2.1-8). Therefore, no cumulative air quality impact analysis or protocol is necessary.

In response to data adequacy issues concerning the potential health impacts from diesel exhaust construction emissions, Section 2.7 describes proposed mitigation that results in lower overall PM<sub>10</sub> concentrations. Attachments 2.1-3, 2.1-4, and 2.1-5 present revised PM<sub>10</sub> concentrations from construction that resulted from this mitigation. Specifically, attachments are as follows:

- Attachment 2.1-3: Revised Table 8.1-18
- Attachment 2.1-4: Revised Appendix B Construction Emission Calculations (replace entire section)
- Attachment 2.1-5: Revised Appendix B Construction Impacts Modeling Files (replace only first table, plus 24-hour PM<sub>10</sub> and annual PM<sub>10</sub> modeling files)

**SB 28 Sher Requirements and Information**

§25552(e)(1) (All): [a]ssure that the thermal powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;

**Information Required to Make AFC Conform with Regulations**

*Specific conditions of certification (such as emission limits, source testing, continuous monitoring, etc.) as would be generally required by the Commission and District.*

**RESPONSE 4**

Please refer to the Preliminary Determination of Compliance (PDOC) for these conditions. The PDOC is provided as Attachment 2.1-6. See also revised condition of certification AQ-C3 (Attachment 2.1-7).

**SB 28 Sher Requirements and Information**

§25552(e)(2) (All): [a]ssure protection of public health and safety;

**Information Required to Make AFC Conform with Regulations**

*Specific conditions of certification (such as emission limits, source testing, continuous monitoring, etc.) as would be generally required by the Commission and District.*

**RESPONSE 5**

Please refer to the PDOC (Attachment 2.1-6) for these conditions. See also revised condition of certification AQ-C3 (Attachment 2.1-7).

**SB 28 Sher Requirements and Information**

§25552(e)(3) (All): [r]esult in compliance with all applicable federal, state, and local laws, ordinances, and standards;

**Information Required to Make AFC Conform with Regulations**

*Specific conditions of certification (such as emission limits, source testing, continuous monitoring, etc.) as would be generally required by the Commission and District.*

**RESPONSE 6**

Please refer to the PDOC (Attachment 2.1-6) for these conditions. See also revised condition of certification AQ-C3 (Attachment 2.1-7).

**SB 28 Sher Requirements and Information**

§25552(e)(5)(B) (Air Quality): [t]hat the thermal powerplant will be recertified, modified, replaced, or removed within a period of three years with a cogeneration or combined cycle thermal powerplant that uses best available control technology and obtains necessary offsets, as determined at the time the combine-cycle

thermal powerplant is constructed, and that complies with all other applicable laws, ordinances, and standards;

**Information Required to Make AFC Conform with Regulations**

*Applicant requests waiver of requirement. Pending legislation may also waive requirement.*

**RESPONSE 7**

GWF Energy LLC has entered into a contract with California Department of Water Resources to meet the State's critical electricity needs. The contract requires that power from the project be supplied for a 10-year period. Accordingly, GWF Energy LLC has requested that the 3-year limitation be waived. This waiver would be consistent with both the spirit and the intent of the Governor's executive orders.

**Attachment 2.1-1**

**Natural Gas Thermal and Chemical Analysis**

**Attachment 2.1-2**

**Estimates of Secondary Emissions from Deliveries**

**Attachment 2.1-2. Estimates of Secondary  
Emissions from Deliveries**

EMISSION FACTORS				ONE-WAY TRUCK DISTANCES WITHIN 10 KILOMETERS (6 MI) OF THE HENRIETTA PEAKER PROJECT SITE		
ROG (g/mi)	CO (g/mi)	NO <sub>x</sub> (g/mi)	PM <sub>10</sub> (g/mi)	From the S. Via SR48 to SR198 to 25th Ave. [50% of Trucks] (mi)	From the N. via SR41 or SR43 to SR198 to 25th Ave [35% of Trucks] (mi)	From the E. via SR198 to 25th Ave [15% of Trucks] (mi)
2.43	26.87	2.76	0.02	7.5	12	11.8
<i>from EMFAC2000, vehicle class of light heavy-duty trucks (8,5000 - 14,000 pounds gross vehicle weight)</i>						

**CONSTRUCTION MATERIALS DELIVERY TRUCKS EMISSIONS**

	One-Way Trips/Day	ROG Emissions (lb/day)	CO Emissions (lb/day)	NO <sub>x</sub> Emissions (lb/day)	PM <sub>10</sub> Emissions (lb/day)
Months 2 & 3 of Construction Period	7	0.365	4.031	0.414	0.003
Months 1, 4, 5, & 6 of Construction Period	15	0.781	8.637	0.887	0.006

**OPERATIONAL MATERIALS DELIVERY TRUCKS EMISSIONS**

	Round Trips/Mo.	ROG Emissions (lb/mo)	CO Emissions (lb/mo)	NO <sub>x</sub> Emissions (lb/mo)	PM <sub>10</sub> Emissions (lb/mo)
Aqueous Ammonia Delivery Trucks	3	0.312	3.455	0.355	0.003
Wastewater Trucks	8	0.833	9.213	0.946	0.007

	Round Trips/Year	ROG Emissions (lb/yr)	CO Emissions (lb/yr)	NO <sub>x</sub> Emissions (lb/yr)	PM <sub>10</sub> Emissions (lb/yr)
Nalco water treatment chemicals	12	1.250	13.819	1.419	0.010
Liquid CO, Diesel Fuel, CTG wash soap	3	0.312	3.455	0.355	0.003
Process gases (nitrogen, nitric oxide, carbon monoxide)	4	0.417	4.606	0.473	0.003

**Attachment 2.1-3**

**Revised Table 8.1-18**

**(HPP ISCST3 Modeling Results—Construction Activities)**



**Table 8.1-18**  
**HPP ISCST3 Modeling Results – Construction Activities**

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Predicted Concentration	Lowest AAQS	UTM Coordinates	
		( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )	East (m)	North (m)
CO	1-hour	2,884	12,941	15,825	23,000	633,050	4,174,475
	8-hour	1,552	9,047	10,599	10,000	633,050	4,174,450
NO <sub>2</sub>	1-hour	224 <sup>a</sup>	224	448	470	632,918	4,174,605
	Annual	29.1	45	74.1	100	633,112	4,174,483
PM <sub>10</sub>	24-hour	26.1	150	184	50	632,863	4,174,646
	Annual	1.63	36.4	39.3	30	633,112	4,174,482
SO <sub>2</sub>	1-hour	218	128	346	655	633,050	4,174,475
	3-hour	136.2	--	136.2	1,300	633,075	4,174,475
	24-hour	35.9	31	67	105	633,111	4,174,482
	Annual	2.77	5.2	8	80	633,112	4,174,482

<sup>a</sup> Results based on OLM applied with maximum ambient ozone concentration of 287.5  $\mu\text{g}/\text{m}^3$ .

AAQS = most stringent ambient air quality standard for the averaging period  
 OLM = ozone limiting method  
 m = meters  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 CO = carbon monoxide  
 NO<sub>2</sub> = nitrogen dioxide  
 PM<sub>10</sub> = particulate matter less than or equal to 10 micrometers in diameter  
 SO<sub>2</sub> = sulfur dioxide  
 UTM = Universal Transverse Mercator

**Attachment 2.1-4**

**Revised Appendix B Construction**

**Emission Calculations**

**(Replace Entire Section)**

**Attachment 2.1-5**  
**Revised Appendix B Construction**  
**Impacts Modeling Files**  
**(Replace Only 24-Hour**  
**PM<sub>10</sub> Modeling Files and Annual PM<sub>10</sub> Modeling Files)**

**Attachment 2.1-6**

**Notice of Preliminary Determination of Compliance (PDOC)**

**Project Number C1011099: Henrietta Peaker Project (01-AFC-18)**

**Attachment 2.1-7**

**Revised Condition of Certification AQ-C3**

Directions: Replace existing condition of certification AQ-C3 in Appendix K5 with the following:

**AQ-C3** Construction equipment rated greater than 100 brake horsepower output shall have diesel exhaust controlled by use of a catalyzed diesel particulate filters.

**Attachment 2.1-8**

**E-Mail from SJVAPCD Regarding**

**Cumulative Impact Sources**

## **Alternatives**



Technical Staff: Bob Eller  
Technical Senior: Paul Richins  
Project Manager: Bob Eller

## 2.2 Alternatives

### Siting Regulations and Information

Appendix B (b) (1) (D): A description of how the site and related facilities were selected and the consideration given to engineering constraints, site geology, environmental impacts, water, waste and fuel constraints, electric transmission constraints, and any other factors considered by the applicant.

### Information Required to Make AFC Conform with Regulations

*Please describe the consideration given to engineering constraints, site geology, environmental impacts, water, waste and fuel constraints.*

### RESPONSE 8

A number of constraints were considered in selecting the project site and facilities. These are summarized below:

#### Engineering Constraints

- Site must interconnect with a major substation on North Path 15 that has adequate capacity
- Site must be configured such that it can be developed on a fast-track schedule that conforms with GWF's existing power purchase agreement with the California Department of Water Resources
- Site must minimize the need for project linears (gas, water, electrical interconnection)
- Site must have adequate size (approximately 7 acres) to accommodate the plant equipment
- Site must be located in Kings County, where GWF has an existing operating facility
- Equipment must conform with SJVAPCD BACT requirements and be classified as a minor source under federal PSD regulations
- Site land use designation must be consistent with a power plant

#### Site Geology

- Site must be relatively flat to minimize the need for extensive grading
- Site must capable of avoiding or mitigating any potentially significant geological hazards

**Environmental Impacts**

- Site must be located in SJVAPCD jurisdiction, where GWF owns existing emission reduction credits
- Site configuration must avoid or mitigate any potentially significant environmental impacts

**Water**

- Site must be in close proximity to a viable, economic source of water
- Water supply must be sufficient to meet the needs of the project
- Any wastewater discharge should be configured to streamline or eliminate any required permits

**Waste**

- Plant should minimize the generation of waste

**Fuel**

- Site must use natural gas as the primary fuel
- Natural gas supply must be in close proximity to the site
- Natural gas supply must be of sufficient quantity to meet the needs of the project

**Siting Regulations and Information**

Appendix B (f) (1): A discussion of the range of reasonable alternatives to the project, or to the location of the project, including the no project alternative, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives. In accordance with Public Resources Code section 25540.6(b), a discussion of the applicant's site selection criteria, any alternative sites considered for the project, and the reasons why the applicant chose the proposed site.

**Information Required to Make AFC Conform with Regulations**

*Please provide a discussion of the range of reasonable alternatives that lessen or avoid the identified environmental impacts of the project.*

**RESPONSE 9**

New Table 5-1 provides a comparative summary of the engineering and economic merits of each alternative site. New Table 5-2 provides a comparative summary of the environmental merits of each alternative site.

**Siting Regulations and Information**

Appendix B (f) (2): An evaluation of the comparative engineering, economic, and environmental merits of the alternatives discussed in subsection (f)(1).

**Information Required to Make AFC Conform with Regulations**

*Please evaluate the comparative engineering, economic, and environmental merits of the alternatives.*

**RESPONSE 10**

See Response 9.

**New Tables for**  
**Section 5.0 (Alternatives)**

**Table 5-1**  
**Overall Comparative Analysis of Engineering Constraints**

<b>Project Site</b>	<b>Electric Transmission</b>	<b>Natural gas</b>	<b>Water</b>	<b>Transportation</b>	<b>Parcel Size/Location</b>	<b>Relative Cost of Construction</b>	<b>Environmental</b>
Henrietta Peaker Project Preferred Site (Olivera 1)	550 foot interconnection	2.2 mile pipeline required to adequate supply interconnection	Virtual onsite connection (16 feet) to existing water supply line with sufficient capacity	Easy access to site	20 acres – more than adequate, provides room for future expansion; Kings County location	Total cost of project minimized primarily by reduced project linear features	No significant impacts with mitigation – See Table 5-2
Olivera 2	2 mile interconnection	2 mile pipeline required to adequate supply interconnection	2 mile connection to existing water supply line with sufficient capacity	Easy access to site	20 acres – more than adequate, provides room for future expansion; Kings County location	Cost higher relative to Olivera 1 primarily because of additional 4 miles of linears	Greater potential impacts than Olivera 1 in areas of biological, cultural and paleontologic resources and air quality due to construction of additional 4 miles of linears – See Table 5-2
Hanford Energy Park Peaker	15 mile interconnection	13 mile pipeline required to adequate supply interconnection	Onsite groundwater well with sufficient capacity	Easy access to site	7 acres – barely adequate, no room for expansion; Kings County location	Cost substantially higher than either Olivera 1 or 2 primarily because of additional 26 miles of linears	Greater potential impacts than Olivera 1 or 2 in areas of biological, cultural and paleontologic resources and air quality due to construction of additional 26 miles of linears – See Table 5-2

**Table 5-2**  
**Comparative Summary of Key Environmental Impact Areas**

<b>Project Site</b>	<b>Biological Resources</b>	<b>Cultural and Paleontologic Resources</b>	<b>Geological Hazards</b>	<b>Agriculture and Soils</b>	<b>Land Use</b>	<b>Air Quality</b>	<b>Water Resources</b>	<b>Waste</b>
Henrietta Peaker Project Preferred Site (Olivera 1)	2.3 miles of linear components – mitigated to insignificance with funds for compensation acreage	2.3 miles of linear components – mitigated to insignificance by avoidance of any potentially significant resources	Site characteristics suitable for construction – no significant geologic hazards that can not be mitigated through engineering design	20 acre parcel currently in agricultural production – would convert approximately 7 acres to industrial use	Zoned AX – power plant is a conforming and compatible use; Land under Williamson Act contract	Project is a minor source under PSD; 2.3 miles of linears minimizes construction-related emissions	Virtual onsite water connection to adequate water supply; near-zero wastewater discharge design to minimize wastewater impacts	No significant generation of hazardous or nonhazardous waste; Phase I site assessment shows no significant contamination expected
Olivera 2	4.3 miles of linear components – increased biological resources impacts, greater compensation acreage required	4.3 miles of linear components – increased potential for disturbance of cultural and paleontologic resources	Site characteristics suitable for construction – no significant geologic hazards that can not be mitigated through engineering design	20 acre parcel currently in agricultural production – would convert approximately 7 acres to industrial use	Zoned AX – power plant is a conforming and compatible use; Land under Williamson Act contract	Project is a minor source under PSD; Greater construction emissions associated with construction of 4.3 miles of linears	2 mile water connection to adequate water supply; near-zero wastewater discharge design to minimize wastewater impacts	No significant generation of hazardous or nonhazardous waste; No Phase I site assessment available – expected results similar to Oliver 1
Hanford Energy Park Peaker	17.2 miles of linear components – significantly greater potential impacts to biological resources, significantly greater compensation acreage required	17.2 miles of linear components – significantly increased potential for disturbance of cultural and paleontologic resources	Site characteristics suitable for construction – no significant geologic hazards that can not be mitigated through engineering design	7 acres remaining on parcel that is currently undeveloped land.	Zoned Industrial - power plant is a conforming and compatible use; No Williamson Act contract	Project is a major source subject to PSD review – could significantly lengthen permitting; Greater construction emissions associated with construction of 17.2 miles of linears	Onsite groundwater well with sufficient capacity; existing wastewater discharge to City of Hanford POTW available	No significant generation of hazardous or nonhazardous waste; Phase I site assessment shows no significant contamination expected

## **Biological Resources**

Technical Staff: Tom Scofield, Natasha Nelson  
Technical Senior: Jim Brownell  
Project Manager: Bob Eller

## 2.3 Biological Resources

### Siting Regulations and Information

Appendix B (g) (13) (A): A regional overview and discussion of biological resources, with particular attention to sensitive biological resources near the project, and a map at a scale of 1:100,000 (or some other suitable scale) showing their location in relation to the project.

### Information Required to Make AFC Conform with Regulations

*On a regional scale, provide a general description of the biological resources, especially sensitive species.*

### RESPONSE 11

Attachment 2.3-1 provides a revised version of Section 8.2.1.1 (Regional Setting) from the AFC. The revised Section 8.2.1.1 presents a general description of the biological resources in the vicinity of the HPP and specific information about sensitive species in this area.

Attachment 2.3-2 provides a regional-scale description of the potential sensitive biological resources in the vicinity of the HPP.

Attachment 2.3-3 contains the revised Section 8.2.1.3 (Wildlife) from the AFC. The “Biologically Sensitive Areas” portion of Section 8.2.1.3 has been revised to incorporate a discussion of the wastewater treatment pond area at Naval Air Station (NAS) Lemoore.

Attachment 2.3-4 provides a revised Table 8.2-1 (Special Status Species with Potential to Occur in the Vicinity of the HPP Site) from the AFC. Three species have been added to the table. Among the species of animals supported by the NAS Lemoore treatment pond area are several federally listed birds. A list of these birds has been requested and will be supplied during discovery.

### Siting Regulations and Information

Appendix B (g) (13) (B): A discussion and detailed maps at a scale of 1:6,000, of the biological resources at the site of the proposed project and related facilities, and in areas adjacent to them, out to a mile from the site and 1000 feet from the outer edge of linear facility corridors. Include a list of the species actually observed and those with a potential to occur. The discussion and maps shall address the distribution of community types, denning or nesting sites, population concentrations, migration corridors, breeding habitats, and the presence of sensitive biological resources.



**Information Required to Make AFC Conform with Regulations**

*Please provide a 1:6,000 scale map of the HPP and its surrounding areas that shows the location of sensitive species (e.g., blunt-nosed leopard lizard and San Joaquin kit fox) and/or their habitat.*

**RESPONSE 12**

No sensitive species were identified within the survey area. Attachment 2.3-5 is a 1:6,000 scale map of the HPP site and its surrounding areas. Because no sensitive species were identified within the survey area, this map does not show the location of any sensitive species or habitat. Attachment 2.3-6 contains the revised Section 8.2.2.1 (Survey Methodology) from the AFC. The revised portion of this section describes the procedures that would have been followed if sensitive species had been encountered during the biological survey described in the AFC.

**Siting Regulations and Information**

Appendix B (g) (13) (C): A description of all studies and surveys used to provide biological information about the project site, including seasonal surveys and copies of the California Department of Fish and Game's Natural Diversity Data Base Survey Forms, "California Native Plant Species Field Survey Forms", and "California Natural Community Field Survey Forms", completed by the applicant. Include the dates and duration of the studies, methods used to complete the studies, and the names and qualifications of individuals conducting the studies.

**Information Required to Make AFC Conform with Regulations**

*Provide the qualifications (resume) for Christine O'Rourke. Provide the CNDDDB database forms.*

**RESPONSE 13**

The resume of Christine O'Rourke is provided in Attachment 2.3-7. Attachment 2.3-8 provides the California Natural Diversity Data Base (CNDDDB) forms for the following quads: Burrel, Guernsey, Hanford, Laton, Lemoore, Riverdale, Stratford, and Vanguard.

**Siting Regulations and Information**

Appendix B (g) (13) (E) (iii): Any educational programs proposed to enhance employee awareness in order to protect biological resources.

**Information Required to Make AFC Conform with Regulations**

*The applicant has provided some language in the Draft BRMIMP that states field personnel will be regularly communicated with in order to meet the terms of the BRMIMP. The applicant needs to specify if an employee awareness program will be developed to protect biological resources.*

**RESPONSE 14**

A description of the Sensitive Species Awareness Training Program is provided as Attachment 2.3-9.

**SB 28 Sher Requirements and Information**

§25552(e)(3) (All): [r]esult in compliance with all applicable federal, state, and local laws, ordinances, and standards;

**Information Required to Make AFC Conform with Regulations**

*The applicant has assumed that the project qualifies to be permitted under the existing Kern Water Bank Habitat Conservation Plan (KWBHCP). Although the Kern Water Bank Authority's Master Permit will allow the incidental take of listed species by third persons for projects with minor impacts, the coverage is limited to specific areas, the closest of which is Kettleman Hills, Kings County. In addition, third party permitting requires prior approval of the USFWS. For staff to have assurance that the application could be permitted for incidental take, provide a letter from USFWS stating their approval of Henrietta Peaker Project to gain permit coverage under this plan. If incidental take cannot be permitted by Kern Water Bank Authority, then provide a letter from USFWS which states an application for a Section 7 or Section 10(a) permit has been accepted as complete. The application must request a "no effect" or "may affect, not likely to adversely affect" for all listed species (Note: only informal consultations can be completed within a 4-month process). Include the name and phone number of any agency contacts, the cover letter sent to the USFWS, and a copy of the Biological Assessment.*

**RESPONSE 15**

A letter from the USFWS indicating that the HPP may participate in the KWBHCP is included in Attachment 2.3-10. This participation will provide the HPP with coverage under the Kern Water Bank Authority's Master Permit and a separate Section 7 or Section 10a process will not be required. The USFWS contact for the Henrietta project is Brian Peterson (916-414-6655).

**Attachment 2.3-1**

**Revised Section 8.2.1.1 (Regional Setting) from AFC**

## Attachment 2.3-1

## Revised Section 8.2.1.1 (Regional Setting) from AFC

**8.2.1.1 Regional Setting**

The HPP site is located in California in the central San Joaquin Valley, one mile south of Naval Air Station (NAS) Lemoore (Figure 8.2-1) in an agricultural area in northern Kings County. The San Joaquin Valley comprises roughly the southern two-thirds of the major north-northwest-oriented structural trough and is sometimes referred to as the Central Valley. The Central Valley is located between the Sierra Nevada Mountains on the east and the Coast Ranges on the west. The general project area is bounded on the west by the ridges that constitute the Diablo Range and on the east by the flood plain of the San Joaquin River.

The general project region has a Mediterranean climate, with hot, dry summers and cool, moist winters. Summer high temperatures often exceed 100 degrees Fahrenheit (°F), with an average of 110 days per year over 90°F. Winter temperatures in the San Joaquin Valley are mild, with an average of 16 days per year with frost (Twisselmann, 1967). Rainfall in the Central Valley averages 7 to 8 inches per year. Winter fog, called “tule fog,” sometimes forms during the months of November, December, and January, supplementing the annual precipitation. On average, approximately 90 percent of the rainfall occurs between November 1 and April 1 (Twisselmann, 1967). The region periodically experiences drought cycles, the most recent of which occurred during the mid and late 1980s.

Habitats of this region include vernal pools, valley sink scrub and saltbush, freshwater marsh, grasslands, arid plains, orchards, and oak savannah. The site lies approximately 2 miles west of a riparian corridor, likely a tributary to Kings River. The growth of agriculture in the Central Valley has converted much of the historical native grassland, woodland, and wetland to farmland. The region supports a mosaic of pastures, dairies, alfalfa fields, hay, row crops, orchards, annual grasslands, and landscape tree communities. Principal land uses in the region are row and field crops, pastures, and vineyards. These land uses remain prevalent in the county even though housing and industrial land uses are becoming more common.

The project site and surrounding properties are currently used for growing cotton. Cotton is cultivated on approximately 90 to 95 percent of the site. The site has been previously used for harvesting cotton for at least 30 years. Before that time, the site was not developed or utilized. Much of the surrounding land is also used for agricultural purposes. The land uses within a one-mile radius of the HPP site are agricultural with the following exceptions: the PG&E Henrietta electrical substation (immediately to the north of the HPP site), the closed New Star agricultural shipping facility (south of the site), and the NAS Lemoore wastewater treatment pond area (northeast of the site).

Biological surveys on the project site and surrounding buffer areas were conducted by a wildlife biologist and a botanist. The project site is on intensive agricultural land and has no habitat features that would be of value to any sensitive species. There is no sensitive wildlife or plant resources at the site. Had any potential or known dens, burrows, or evidence of sensitive species been found, they would have been marked in the field with flags and mapped on a site map.

The wildlife species that use the agricultural habitat on the project site tend to occur across all habitat types rather than only a single habitat. Wildlife species that would use the patchwork of changing crops and ruderal vegetation, including the HPP site, are described in Section 8.2.1.3 (see Attachment 2.3-3 in this Supplement). These species are likely to occur widely and be relatively common because the habitat is highly disturbed.

**Attachment 2.3-2**  
**Sensitive Biological**  
**Resource Species Accounts**

**Attachment 2.3-2. Sensitive Biological Resource Species Accounts*****Vulpes macrotis mutica* (San Joaquin kit fox)**

Status: Federal -Endangered

State -Threatened

Other -None

(The following species account was taken from the Pleasant Valley Draft Habitat Conservation Plan, 1994.)

The San Joaquin kit fox is one of the eight recognized subspecies kit fox. It resembles a small lanky dog in appearance, with disproportionately large ears containing an abundance of large, white inner guard hairs. The San Joaquin kit fox is the largest subspecies of kit fox, with adults weighing 4.5 to 5 pounds (2-2.3 kg). Total length is about 32 inches, including up to a 12-inch black-tipped tail. Coloration ranges from light buff to grayish along the back and tail, gray, rust, or yellowish along the sides, and white on the belly (O'Farrell 1983).

San Joaquin kit foxes are generally nocturnal and are opportunistic carnivores. They feed on rodents, lagomorphs, birds, reptiles and insects, as well as on carrion such as road kills. Studies indicate that the primary food items may vary geographically and seasonally (Kakiba-Russell et al. 1991).

Dens are typically excavated in loose soil (O'Farrell 1983), but also occur in harder clay soils in the northern portion of their range. Dens are not found in saturated soils or in areas subjected to periodic flooding (Kakiba-Russell et al. 1991). Individual animals may utilize from 3 to 24 separate dens (Morrell 1972). Number of den entrances may range from 1 to 36 (O'Farrell 1983), and may extend into several tunnels and chambers reaching depths of up to 10 feet (O'Farrell 1987). Most dens are vacant at any given time. During times when dens are unoccupied kit fox, they may be occupied by other burrowing animals such as badger, ground squirrels, skunks, and burrowing owls (Kakiba-Russell et al. 1991). Although occupied dens may show freshly excavated soil, scats, and prey remains (O'Farrell 1987), sign may also be

inconspicuous or absent (Hall 1983). Typical den entrances are characteristically higher than wide, and are small enough to prevent access by large carnivores such as coyotes. Den entrance hole dimensions are generally about 8 to 10 inches in height and less than 8 inches in width (O'Farrell 1987), but may be as small as 4 inches in width. Burrows of other animals, particularly California ground squirrels (*Spermophilus beecheyi*), are opportunistically enlarged and utilized as den sites by San Joaquin kit foxes (Balestreri 1981). Most dens are found in areas with slope angles of less than 40 degrees, and natal and pupping dens are found more frequently on gentle slopes or in flat terrain. Man-made structures such as culverts and pipes may also be used as dens (O'Farrell 1983).

Individual San Joaquin kit foxes have an average home range of 1 to 2 square miles (Knapp 1978; Morrell 1972). Courtship and mating occur in December and January. Pups are typically born in February and March, and begin to disperse at around five months of age (Morrell 1972; O'Farrell 1983). About 75% percent of kit fox pups die before the age of eight months (O'Farrell 1984).

San Joaquin kit foxes occur in Valley Saltbush Scrub, Valley Sink Scrub, Interior Coast Range Saltbush Scrub, Upper Sonoran Sub-shrub Scrub, Non-native Grassland, and Valley Sacaton Grassland. In general, kit fox are not found in densely wooded areas, wetland areas, or areas subject to frequent periodic flooding. Habitats altered by agricultural and urban developments are unsuitable for long-term kit fox inhabitation (Kakiba-Russell et al. 1991).

The San Joaquin kit fox was historically distributed over a large portion of central California, extending roughly from southeastern Contra Costa County south along the eastern flanks of the Interior Coast Range to the southern San Joaquin Valley, including major portions of western Kern County and Tulare County. San Joaquin kit fox were also distributed through adjacent valleys, foothills, and plains, including portions of San Luis Obispo County, Monterey County, and the Santa Clara Valley on the western side of the Interior Coast Range (Morrell 1975).

Habitat conversion for agricultural and a variety of urban uses has been the principal cause of kit fox population declines, and the reason for both state and federal listing of this species. O'Farrell (1983) estimated that approximately 42 percent of suitable kit fox habitat



was lost as a result of such developments. Since that estimate was made, substantial additional habitat loss has occurred. Mortality of kit foxes has been documented from attacks by coyotes, road kills, conversion of habitat, shooting, drowning, entombment, pneumonia, and starvation (Morrell 1975; Knapp 1978; O'Farrell et al. 1986; Berry et al. 1987). Additionally, the use of certain rodenticides has resulted in secondary mortality, since kit foxes are vulnerable to poisoning through consumption of poisoned rodents (USFWS 1985b).

***Dipodomys nitratoides nitratoides* (Tipton kangaroo rat)**

Status:       Federal -Endangered  
                  State -Endangered  
                  Other -None

(The following species account was taken from Endangered Species Recovery Program *Listed Species Accounts*.)

The Tipton kangaroo rat is one of three subspecies of the San Joaquin kangaroo rat (*Dipodomys nitratoides*). Tipton kangaroo rats are visually similar to other kangaroo rats; they have a tawny yellow head and back with a white belly and a white stripe on the elongated hind legs that continues down the sides of the otherwise black tail. Other characteristics include: a large head, compared to other rodents, with large dorsally-placed eyes and small rounded ears; small forelegs with strong claws; and a long, tufted tail.

Tipton kangaroo rats eat mostly seeds, but will supplement their diet with green, herbaceous vegetation and insects when available. Most aspects of food and foraging of Tipton kangaroo rats are identical to those of Fresno kangaroo rats, *Dipodomys nitratoides exilis*

Little specific information is available on the reproduction of Tipton kangaroo rat. In general, this aspect of their biology is similar to that of the Fresno kangaroo rat. Reproduction occurs in the winter months with most females giving birth to only one litter of two young. Some females born early in the year may breed when about 12 weeks old.

Tipton kangaroo rats inhabit arid-land vegetative communities with level or nearly level terrain located within the floor of the Tulare Basin in the southern San Joaquin Valley. Many of the presently inhabited areas have one or more species of woody shrubs, such as saltbush, iodine bush, goldenbush, and honey mesquite, sparsely scattered throughout and a ground cover dominated by introduced and native grasses and forbs. Burrows are commonly located in slightly elevated mounds, the berms of roads, canal embankments, railroad beds, and bases of shrubs and fences where wind-blown soils accumulate above the level of surrounding terrain. Soft soils, such as fine sands and sandy loams, and powdery soils of finer texture and of higher salinity generally support higher densities of Tipton kangaroo rats than other soil types. Terrain not subject to flooding is essential to sustain a population of Tipton kangaroo rats. The placement of burrows on elevated grounds in flood-prone areas is important, but depending on the extent and duration of the flooding, those burrows and populations may still be adversely affected.

Historically, Tipton kangaroo rats were distributed south of the Kings River on the north and eastward and southward along the edge of the San Joaquin Valley floor in Tulare and Kern counties to the foothills of the Tehachapi Mountains. The westward edge of their ranges were the marshes and open water of Kern and Buena Vista lakes and the sloughs and channels of the Kern River alluvial fan.

Current distribution is not completely known-occurrences of the Tipton kangaroo rats are limited to scattered, isolated clusters west of Tipton, Pixley, and Earlimart and in areas in southern Kern County. Cultivation and urbanization has reduced much of the area historically inhabited. However, in recent years, Tipton kangaroo rats have reinhabited several hundred acres that were formerly in crop production but were retired and allowed to go fallow due to drainage problems, or lack of water, or were acquired by state or federal government as wildlife habitat.

***Branchinecta longiantenna* (longhorn fairy shrimp)**

Status: Federal -Endangered  
State -None  
Other -None

(The following species account was taken from Federal Register Final Listing Document 59 FR 48136 48153.)

The longhorn fairy shrimp, a member of the family branchinectidae, was described from specimens collected at Souza Ranch in the Kellogg Creek watershed, about 35 kilometers (22 miles) southeast of the City of Concord, Contra Costa County (Eng et al. 1990). It ranges in size from 12.1 to 20.8 mm (0.5 to 0.8 inches). This species differs from other branchinectids in that a portion of the distal segment of its antennae is flattened in the antero-posterior plane rather than the latero-medial plane.

The longhorn fairy shrimp inhabits clear to turbid grass-bottomed vernal pools in grasslands and clear-water pools in sandstone depressions. This species is known only from four disjunct populations along the eastern margin of the central coast range from Concord, Contra Costa County south to Soda Lake in San Luis Obispo County: the Kellogg Creek watershed, the Altamont Pass area, the western and northern boundaries of Soda Lake on the Carrizo Plain (Eng et al. 1990), and Kesterson National Wildlife Refuge in the Central Valley (Dennis Woolington, U.S. Fish and Wildlife Service, in litt. 1993). All vernal pools inhabited by this species are filled by winter and spring rains and may remain inundated until June. The longhorn fairy shrimp has been observed from late December until late April. The water in grassland pools inhabited by this species has very low conductivity, TDS, and alkalinity (Eng et al. 1990).

***Branchinecta lynchi* (vernal pool fairy shrimp)**

Status: Federal -Endangered  
State - None  
Other -None

(The following species account was taken from Federal Register Final Listing Document 59 FR 48136 48153.)

The vernal pool fairy shrimp), a member of the family Branchinectidae, was described from specimens collected at Souza Ranch in the Kellogg Creek watershed, Contra Costa County, California (Eng et al. 1990). It ranges in size from 10.9 to 25.0 mm (0.4 to 1.0 inches). This species most resembles the Colorado fairy shrimp *Branchinecta coloradensis*). There are several differences in the antennae of the males of the two species, including the basal segment outgrowth below and posterior to the pulvillus, which is ridge-like in the vernal pool fairy shrimp but is cylindrical and often much larger in the Colorado fairy shrimp. The shorter brood pouch of the vernal pool fairy shrimp is pyriform, whereas the longer one in the Colorado fairy shrimp is fusiform (Eng et al. 1990).

Although the vernal pool fairy shrimp has a relatively wide range, the majority of known populations inhabit vernal pools with clear to tea-colored water, most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands, but one population occurs in sandstone rock outcrops and another population in alkaline vernal pools. The vernal pool fairy shrimp has been collected from early December to early May. The water in pools inhabited by this species has low TDS, conductivity, alkalinity, and chloride (Collie and Lathrop 1976). This species has a sporadic distribution within vernal pool complexes (Jones and Stokes, 1992, 1993; County of Sacramento 1990; Patton 1984; Stromberg 1993; Sugnet and Associates 1993b) wherein the majority of pools in a given complex typically are not inhabited by the species. Simovich et al. (1992) reported that the vernal pool fairy shrimp typically is found at low population densities. Only rarely does the vernal pool fairy shrimp co-occur with other fairy shrimp species, but where it does, the vernal pool fairy shrimp is never the numerically dominant one (Eng et al. 1990).

Although it can mature quickly, allowing populations to persist in short-lived shallow pools, it also persists later into the spring where pools are longer lasting (Simovich et al. 1992). Sugnet and Associates (1993b) listed 178 records for the species out of 3092 "discrete locations" containing potential habitat in their report. These 178 records represent the 32 known populations of the vernal pool fairy shrimp, which extend from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng et al. 1990; M. Fugate, pers. comm., 1991; Sugnet & Associates 1993b). Five of these populations are

believed to be comprised of a single inhabited pool. Four additional, disjunct populations exist; one near Soda Lake in San Luis Obispo County, one in the mountain grasslands of northern Santa Barbara County, one near the Santa Rosa Plateau in Riverside County, and one near Rancho California in Riverside County. Three of these four isolated populations contain only a single known pool occupied by the vernal pool fairy shrimp.

***Lepidurus packardi* (vernal pool tadpole shrimp)**

Status: Federal - None  
State - Threatened  
Other -None

(The following species account was taken from Federal Register Final Listing Document 59 FR 48136 48153.)

The vernal pool tadpole shrimp, a member of the family Triopsidae, was described by Eugene Simon in 1866 (Longhurst 1955a). Longhurst (1955a) placed the name in synonymy with *Lepidurus apus*. Subsequently, Lynch (1972) examined the taxa and determined that *Lepidurus packardi* is a valid species. The Service accepts Lynch's taxonomic treatment of the genus *Lepidurus*, which maintains *L. packardi* as a species.

Vernal pool tadpole shrimp adults reach a length of 50 millimeters (2 inches). They have about 35 pairs of legs and two long cercopods. This species superficially resembles the ricefield tadpole shrimp (*Triops longicaudatus*). However, *Lepidurus* possess a flat paddle-shaped supra-anal plate that is entirely lacking in members of the genus *Triops* (Pennak 1989; R. Brusca in litt., 1992; M. Simovich in litt., 1992; J. King in litt., 1992). The vernal pool tadpole shrimp is known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south through the Central Valley to the San Luis National Wildlife Refuge in Merced County, and from a single vernal pool complex located on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County.

The vernal pool tadpole shrimp inhabits vernal pools containing clear to highly turbid water, ranging in size from 5 square meters (54 square feet) in the Mather Air Force Base

area of Sacramento County, to the 36 hectare (89 acre) Olcott Lake at Jepson Prairie. The pools at Jepson Prairie and Vina Plains have a very low conductivity, TDS, and alkalinity (Barclay and Knight 1984; Eng et al. 1990). These pools are located most commonly in grass bottomed swales of grasslands in old alluvial soils underlain by hardpan or in mud-bottomed pools containing highly turbid water.

The life history of the vernal pool tadpole shrimp is linked to the phenology of the vernal pool habitat. After winter rainwater fills the pools, the populations are reestablished from diapaused eggs that lie dormant in the dry pool sediments (Ahl 1991; Lanway 1974). Ahl (1991) found that eggs in one pool hatched within three weeks of inundation and saturated to sexually reproductive adults in another three to four weeks. Simovich et al. (1992) reported sexually mature adults occurred in another pool three to four weeks after the pools had been filled. A female surviving to large size may lay up to six clutches of eggs, totaling about 861 eggs in her lifetime (Ahl 1991). The eggs are sticky and readily adhere to plant matter and sediment particles (Simovich et al. 1992). A portion of the eggs hatch immediately and the rest enter diapause and remain in the soil to hatch during later rainy seasons (Ahl 1991). The vernal pool tadpole shrimp matures slowly and is a long-lived species (Ahl 1991; Alexander 1976). Adults are often present and reproductive until the pools dry up in the spring (Ahl 1991; Simovich et al. 1992).

***Buteo swainsoni* (Swainson's hawk)**

Status: Federal -None

State - Threatened; CNDDDB Special Animal

Other - Protected under the Migratory Bird Treaty Act of 1918

Swainson's hawks are large (body length averages 21 inches), slim-winged, long-tailed hawks that frequent open country. Their plumage is extremely variable. Although this species is about the same size as a red-tailed hawk, the Swainson's hawk can be most easily distinguished by its relatively long, narrow, pointed wings (the wingspan is approximately 52 inches). Swainson's hawks are very buoyant in flight (Dunne *et al.* 1988) and rocks back and

forth similar to the rocking flight of turkey vultures and northern harriers. The sexes are similar in appearance; however, females are slightly larger than males.

Swainson's hawks are long-distance migrators. After leaving nesting grounds in northwestern Canada, the western U.S., and Mexico, most populations migrate to wintering grounds in South America. Currently, They are summer breeders in California with approximately 80 percent of the pairs nesting in the southern Sacramento and northern San Joaquin valleys. These birds return to California between late February and early April, breed during spring and summer, and depart on their fall migration from late August through mid-October.

Swainson's hawks nest throughout most of the Central Valley, although nesting habitat is fragmented and unevenly distributed. More than 85 percent of the known nests in the Central Valley are within riparian systems in Sacramento, Yolo, and San Joaquin counties. The riparian areas are generally adjacent to and within easy flying distance of alfalfa or hay fields. These open fields and pastures are the primary foraging areas.

During the breeding season, Swainson's hawks eat mainly vertebrates (small rodents, birds, and reptiles), whereas during migration, vast numbers of insects are consumed (Palmer 1988). Occasionally during the fall, large flocks of migrating Swainson's hawks gather in agricultural fields in the Central Valley to forage on grasshoppers and other large insects that are easily captured in recently plowed or mowed fields (Beedy and Granholm 1985; Ehrlich *et al.* 1988).

The Swainson's hawk was historically (ca. 1900) regarded as one of the most common raptor species in the state, so much so that they were often not given special mention in field notes. The breeding population has declined by an estimated 91 percent in California since the turn of the century (Bloom 1980). There had been no documented Swainson's hawk nests in the Central Valley portion of Kern County for several decades until the spring 1991, five adult Swainson's hawks built two nests in oak-savanna habitat between Caliente and Arvin. The 1989 population estimate was 430 pairs for the Central Valley and 550 pairs statewide.

Swainson's hawks rely on pasturelands and alfalfa fields for their principal foraging habitat. The dramatic population decline from historic levels has been attributed to loss

of native nesting and foraging habitat, and more recently from the conversion of agriculture to urban uses and the loss of existing (and suitable) nest sites in agricultural, woodland, and riparian areas. The replacement of alfalfa and pastureland with incompatible agricultural uses such as rice and orchards further reduces the available foraging habitat. In addition, pesticides, shooting (Tyler 1916), disturbance at the nest site, and other disturbances on wintering areas may have contributed to their decline. The loss of nesting habitat within riparian areas has been accelerated by flood control practices and bank stabilization programs; Smith (1977) estimated that in 1850 over 770,000 acres of riparian habitat were present in the Sacramento Valley alone. Today less than 12,000 acres of riparian habitat remain. A 98 percent decrease in riparian vegetation has been documented within the Central Valley (Katibah 1983).

***Athene cunicularia* (burrowing owl)**

Status: Federal - Protected under the Migratory Bird Treaty Act of 1918.

State - Species of Special Concern; CNDDDB Special Animal

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

Adult burrowing owls are sandy colored over the head, back, and wings, with barring on the breast and belly. During summer months females usually appear darker than males (Farrand 1983). Juveniles are smaller, and buffy below. Burrowing owls are medium-sized (body length averages 9.5 inches), yellow-eyed owls with disproportionately long legs. The tail is very short; the head is rounded and lacks ear tufts. The long, exposed lower legs, and the characteristic "bowing" behavior that the bird displays when approached or otherwise disturbed, quickly distinguish this owl from all other small owls (Farrand 1983). During the nesting season, the burrowing owl often perches on a low post or at the entrance to a burrow. Calls are often synchronized with bowing behavior. When approached or flushed, both sexes commonly give a sharp 'chatter' call. A rasping call, similar to a rattlesnake's rattle, may be given from inside the burrow when the bird is disturbed (Farrand 1983).



Burrowing owls breed in midwestern and western North America, and also in south-central Florida. They winter throughout their breeding range and south to Central America. Several breeding populations exist in the Central Valley. Burrowing owls often wander outside their breeding range in the winter.

These owls use burrows throughout the year and although there is evidence that they will dig their own burrows (Thomsen 1971), they more commonly use old burrows dug by mammals.

Resident burrowing owls begin pair formation as early as December, and migratory birds begin upon their arrival in the breeding area, usually in March and April. Six to eleven eggs are laid during late March to early May. Incubation lasts about four weeks. The young emerge from the burrow at about two weeks of age and are able to fly well at about six weeks (Zarn 1974). Nests are generally located in bare, level ground in abandoned mammal burrows (Verner and Boss 1980). Nest chambers in the southern San Joaquin Valley are usually 2 feet or more beneath the surface at the end of a burrow that may be from 5 to 18 feet in length (JHA 1992).

Burrowing owls inhabit dry, open grasslands, rolling hills, desert floors, prairies, savannas, agricultural land, and other areas of open, bare ground. This species prefers lower elevation habitats (Verner and Boss 1980). These owls will also inhabit open areas near human habitation, such as airports, golf courses, shoulders of roads, railroad embankments, and the banks of irrigation ditches and reservoirs.

Burrowing owls forage during any time of the day or night in areas adjacent to burrows and nest sites. Zarn (1974), Marti (1969, 1974), and Thomsen (1971) have thoroughly studied the food habits of this species and agree that they feed primarily on insects and other arthropods, small birds, and mammals. They will take whatever prey species are most abundant in their area, including a wide variety of mice species, other rodents, frogs, toads, crayfish, birds, or reptiles. In the southern San Joaquin Valley, some of their major invertebrate prey include large beetles (*Eleodes* spp.), grasshoppers, crickets, centipedes, and scorpions (Small 1974).

Burrowing owls were formerly a common, even locally abundant, permanent resident throughout much of California. A decline noticeable in the Fresno area by the early

1900's (Miller 1903, Tyler 1913) and statewide by the 1940's (Grinnell and Miller 1944) has continued through to the present (Remsen 1978). In recent years, burrowing owl numbers have been declining throughout California. For example, Remsen (1978) reported that there had been an estimated 70 percent reduction in suitable habitat in Tulare County between 1968 and 1978.

Conversion of grasslands and pasturelands to agriculture, increasing urban development, and destruction of ground squirrel colonies (which reduce prey availability and potential nesting sites) have been the main factors causing the decline of burrowing owl populations (Zarn 1974). Assimilation of poisons applied to ground squirrel colonies has probably also taken a toll (Remsen 1978). The propensity for nesting in roadside banks makes burrowing owls particularly vulnerable to roadside shooting, being hit by cars, mad maintenance operations, and general harassment. Burrowing owls are usually tolerant of human activity, but are vulnerable to predation by domestic cats and dogs.

***Lanius ludovicianus* (loggerhead shrike)**

Status: Federal - Protected under the Migratory Bird Treaty Act of 1918.

State - Species of Special Concern

(The following species account was taken from the Pleasant Valley Draft Habitat Conservation Plan, 1994.)

The loggerhead shrike is a robin-sized bird (length - 9 inches) with a raptor-like, hooked bill. Dorsal coloration is bluish-gray, and ventral coloration is whitish, with very faint barring, juveniles are more brownish. Most distinctive is the black eye mask, and in flight, the white wing patches on the contrasting dark wings. Distinguished from the northern mockingbird, which it resembles in flight, by darker wing and smaller white wing patches; also, the mockingbird lacks conspicuous eye patch and hooked bill, and has slower wing beats.

This shrike occurs over most of the U.S., Mexico, and central Canada. In California, the shrike occurs as a resident over most of the state, being absent front high mountain regions. Habitat consists of open areas such as savannas and deserts, where bushes, small trees, or other perch sites are available. Also called the "butcher bird," the loggerhead

shrike is an impressive predator that characteristically impales its prey on thorns, barbed wire, or other sharp projections. Lacking talons, the shrike impales its prey to facilitate feeding, or to store it for future consumption. Diet includes a variety of insects and spiders, small reptiles, rodents, and small birds (Bent 1958).

The primary threat to the loggerhead shrike in the San Joaquin Valley is the loss of suitable habitat through conversion to agriculture, urbanization, and petroleum development.

***Gambelia sila* (blunt-nosed leopard lizard)**

Status: Federal -Endangered  
State-Endangered  
Other –None

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

The blunt-nosed leopard lizard is a relatively robust lizard with a large head and blunt snout. It was historically distributed over the San Joaquin Valley adjacent lower foothills, plains, and valleys (Montanucci 1965). Adult snout-vent length is approximately 3.5 to 5 inches (USFWS 1985a), and total length may reach up to 13 inches. Coloration consists of a light grayish, tan, or brown background with a conspicuous pattern of dark overlaying spots and/or pale crossbars. During the spring courtship season both sexes may develop reddish markings on the sides, tail, and ventral surfaces. Juveniles usually show a similar, but more yellowish pattern. Approximately two to three eggs are laid in excavated chambers at the end of rodent burrows. Hatchlings emerge in early August (USFWS 1985a).

Blunt-nosed leopard lizards are active during the day. Peak daily activity usually occurs when air temperatures are between 75 and 95 degrees Fahrenheit. Most annual activity occurs between the months of April and early October. Animals overwinter underground in rodent burrows (USFWS 1985a). Food consists primarily of insects such as grasshoppers, although smaller lizards may also be consumed. Leopard lizards occur on sparsely vegetated

plains, lower canyon slopes, on valley floors, and in washes. Associated vegetation may include a variety of grasses, saltbush, golden bush, iodine bush, and seepweed (*Suaeda fruticosa*) (USFWS 1985a). Results of systematic inventories for blunt-nosed leopard lizards on federal lands in the San Joaquin Valley have demonstrated that this species has an affinity for open habitats and wash systems with relatively level topography (Chesemore 1980; Jones 1980; O'Farrell 1980; O'Farrell et al. 1981).

Population densities of blunt-nosed leopard lizards are highly variable. Chesemore (1980), in a study of two sites near Taft (Kern County), estimated densities of between 0.1 and 0.5 lizards per acre. Densities of blunt-nosed leopard lizards at Pixley National Wildlife Refuge (Tulare County) ranged from 0.12 to 4.14 lizards per acre (Uptain et al. 1985).

Habitat loss is the principal reason for both state and federal listing of this species as endangered. Much of the historical habitat of this lizard has been converted to agricultural production. Other factors contributing to the endangerment of this species include petroleum development, livestock grazing, and pesticide application (USFWS 1985a).

***Ambystoma tigrinum californiense* (California tiger salamander)**

Status: Federal - Species of Concern  
State - Species of Special Concern  
Other - None

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

The California tiger salamander is a relatively large, stocky black salamander with large cream-colored spots and cream-colored bands on the lower sides. It grows to 6.5 in (16 cm) in snout-vent length (its total length can be up to about 10 inches) (Stebbins 1985). Tiger salamanders are carnivorous, feeding on earthworms, fish, insects, amphipods, and a wide variety of invertebrate and vertebrate larvae.

Adult tiger salamanders spend most of their time underground, occupying burrows dug by ground squirrels, gophers, and badgers. They emerge only for brief periods to

feed and breed. Although aestivation sites may be as far as 3,000 ft (1,000 m) from the breeding ponds, they are usually much closer. There is considerable site fidelity among tiger salamanders, as they tend to use the same ponds and burrows throughout their adult lives. They emerge from their burrow sites after the onset of winter rains and begin their above-ground activity after their breeding ponds, often temporary rain pools, have begun to form. Migration to breeding ponds usually takes place during rainfall, and often at night (Stebbins 1985). The larvae begin to transform in late spring, and by July most have left the ponds in search of suitable aestivation sites.

California tiger salamanders are found in the Central Valley from Yolo County to Kern County, and in coastal areas from the San Francisco Bay Area to Santa Barbara County. Most records are reported from elevations below 1,000 ft (300 m). They inhabit temporary and permanent ponds such as vernal pools, small lakes and stock ponds where predators are absent (e.g., fish, bullfrogs), yet which hold water for several months, long enough for the salamander larvae to transform. Streams are rarely used as breeding habitat.

The California tiger salamander has experienced direct loss of habitat from agricultural conversion and urbanization, and much of its remaining habitat has been degraded by alteration of breeding ponds and destruction of burrows. Work with allozymes and mitochondrial DNA indicates that populations of *A. t. californiense* are genetically isolated, so efforts to preserve the genetic integrity of the species must focus on protection at the population level (Stanley 1993).

### ***Taxidea taxus* American badger**

Status: Federal - None  
State - Species of special concern  
Other - None

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

American badgers are low, squat animals with conspicuous silver-tipped pelage dorsally and a short, black-tipped tail. The most striking visual feature of this species is its striped face, consisting of two median white stripe proceeding from the tip of its nose to the back of its head. This stripe is flanked by alternating white and dark stripes giving way to bright, white-outlined ears. The badger's wide flattened body is supported by short but powerful legs. The front feet are fitted with noticeably long claws that are especially well-suited for digging out the burrows of the rodents on which it feeds.

Historically, badgers are thought to have been fairly widespread in the open grassland habitats of the lower San Joaquin Valley. Their modern San Joaquin Valley distribution is essentially restricted to the limited, often isolated and remote tracts of native grassland and shrubland habitats. Cultivated lands have been reported to provide little usable habitat for this species, and badgers are believed to be declining throughout California (Williams 1986).

Badgers are solitary animals. They usually forage for burrowing prey such as gophers, ground squirrels, marmots, and kangaroo rats, although they are known to take a variety of nesting mammals, reptiles, and birds.

*Badger densities are variable and* some reports have suggested that there is little difference between the home range requirements of males and females. Other reports have shown that a seasonal difference in the home range of individual animals *exists* (Sargeant and Warner 1972; Messick and Homocker 1981).

In California, badgers range throughout the state except for the humid coastal forests of northwestern California in Del Norte County, and the northwestern portion of Humboldt County (Williams 1986). Badger populations have declined dramatically within California over the past century (Grinnell et al. 1937). Grinnell et al. (1937) noted that badgers were reduced in numbers throughout California, but were still numerous within the San Joaquin Valley. Badgers now survive in low numbers in the San Joaquin Valley on the periphery of the valley and adjacent lowlands to the west in eastern Monterey, San Benito, and San Luis Obispo counties (Williams 1986).

The principal cause of the decline in American badger populations is the conversion of native grassland habitats to modern agricultural uses. Although no specific estimates are available, American badgers doubtless have suffered a similar reduction in suitable habitat as have other wildlife species resident on the valley floor. Deliberate killing, as well as direct and secondary mortality from rodent poisoning, have also contributed to their decline.

***Perognathus inornatus* (San Joaquin pocket mouse)**

Status: Federal - None

State - Species of special concern

Other - None

The San Joaquin pocket mouse inhabits open grasslands or scrub areas on fine textured soils in the San Joaquin and Salinas valleys, often sharing habitat with kangaroo rats (*Dipodomys* sp.). They forage for plant seed as well as eating green vegetation and insects. Seeds are carried in cheek pouches and stored in burrows for later consumption (CDFG 1990). These small pocket mice (10-20 grams) are very sensitive to cold temperatures and will go into torpor at temperatures below 50° F (pers. Obs).

***Onychomys torridus tularensis* (Tulare grasshopper mouse)**

Status: Federal - None

State - Species of special concern

Other - None

The Tulare grasshopper mouse, a subspecies of the southern grasshopper mouse, fits the general description of the genus *Onychomys* by having a stout body with a short, club-like tail. They are sharply bicolored with the head and upperparts pale brown to gray or pinkish-cinnamon and the underparts white. The tail is usually bicolored with a white tip. The young and subadults are gray in color. The feet of the southern grasshopper mouse have five tubercles (knob-like fleshy bumps) on the sole of each forefoot and four on the hindfeet.

The grasshopper mouse is primarily a carnivore, with a particular appetite for small mammals and insects; it will also eat other invertebrates and seeds. Specific information on the reproduction and mating system of the Tulare grasshopper mouse is unknown. For the southern grasshopper mouse, which lives in burrows, breeding is seasonal with the young born from May through July. Captive populations of this species breed throughout the year and gestation is between 27 and 32 days. In the wild, up to 3 litters per year may be produced. The adult males are highly territorial and frequently vocalize at night. They emit a high-pitched call, lasting several seconds, while standing on their hind legs with head raised and mouth open.

Typically, Tulare grasshopper mice inhabit arid shrubland communities in hot, arid grassland and shrubland associations. These include blue oak woodlands at 450 m (1476 feet); upper Sonoran subshrub scrub habitat; alkali sink and mesquite associations on Valley Floor; and grasslands associations on the sloping margins of the San Joaquin Valley and Carrizo Plain region. Specific habitat requirements are unknown.

Like most of the other sensitive species of the San Joaquin Valley, habitat reduction, fragmentation, and degradation are the principle causes of the decline of the Tulare grasshopper mouse. Use of insecticides may have contributed to the extirpation of this species from fragmented habitat on the Valley floor by reducing their main food source and from both direct and indirect poisoning.

Historically, the Tulare grasshopper mouse ranged from western Merced and eastern San Benito counties east to Madera County and south to the Tehachapi Mountains. Currently, they are known to occur in these areas: along the western margin of the Tulare Basin, including western Kern County; Carrizo Plain Natural Area; along the Cuyama Valley side of the Caliente Mountains, San Luis Obispo County; and the Ciervo-Panoche Region, in Fresno and San Benito counties.

### ***Caulanthus californicus* (California jewelflower)**

Family: Brassicaceae



Status: Federal -Endangered  
State-Endangered  
CNPS -List IB

Flowering Period: February -April

Habitat: Dry plains and slopes in native valley grasslands

Range: Fresno, Kings, Kern, San Luis Obispo, Tulare, and Santa Barbara counties

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

The California jewelflower is an annual reaching a height of 6 to 15 inches. Foliage is gray-green, with heart-shaped clasping stem leaves and wavy margined strap-shaped basal leaves. Unopened flowers appear deep maroon in color. Open flowers are white to greenish-yellow. Suitable habitat for this species is non-alkaline to slightly alkaline sandy loam soils of relatively undisturbed grassland communities below an elevation of 3,000 feet.

Historically, the range of the species included the upper San Joaquin and adjacent valleys from Coalinga in the northwest to the Cuyama Valley in the southwest. Of 55 historical locations, approximately twenty extant populations remain (Skinner and Pavlik 1994). Recently, extant populations have been found on the Carrizo Plain in San Luis Obispo County, and in the Kreyenhagen Hills of Fresno County. An attempt has been made to establish an artificial population at the Paine Wildflower Preserve, Kern County.

***Cirsium crassicaule* (slough thistle)**

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

Family: Asteraceae

Status: Federal - Category 2  
State - None  
CNPS - list 1B

Flowering Period: May - August

Habitat: Shallow water, stream banks and wet places

Range: Kings, Kern and San Joaquin counties

This biennial species, which appears to grow as an annual, is distinguished from the weedy *Cirsium* species by the presence of pinnate spines on the phyllaries. The slough thistle is a tall robust annual that ranges from 3 to 6 feet in height. The lower stem is typically unbranched while the upper portion is commonly much branched, supporting several paniculately disposed heads. Herbage is prominently hoary-tomentose to sometimes glabrescent on the upper surfaces. Individual leaves are lanceolate in overall shape with sinuate-pinnatifid margin. Individual lobes are often spine tipped. Flowers are whitish to pinkish.

Slough thistle is found in low-lying, seasonally to permanently wet habitats on the valley floor. The population locations in Kern and Kings counties indicate that this plant can tolerate disturbed habitats. The northern populations of this species (in San Joaquin County) tends to be disjunct, which suggests possible dissemination by water or equipment. A single extant population is known to occur at the Kern National Wildlife Refuge.

***Delpinium recurvatum* (recurved larkspur)**

(The following species account was taken from *the Pleasant Valley Draft Habitat Conservation Plan, 1994*.)

Family: Ranunculaceae

Status: Federal - None  
State - None

## CNPS - List IB

Flowering Period: April - May

Habitat: Alkaline valley grasslands, inner coastal hills

Range: Contra Costa, Colusa, Fresno, Kings, Kern, Merced, San Luis Obispo, Solano, and Tulare counties

This very showy species is characterized by strongly bicolored flowers with a spur that is recurved at maturity. It has erect reddish to purple stems that range from 8 to 24 inches in height. Stems are slightly hairy below and glabrous in the inflorescence. Leaves are several, 0.6 to 1.2 inches long, pinnatifid into fewparted divisions, and hairy beneath. The inflorescence supports 15-24 flowers that have light blue sepals and cream to white petals.

Recurved larkspur grows in subalkaline soils supporting shrubby or grassland habitats of the western Central Valley from Contra Costa County to Kern County. Co-occurring species include saltbush, brome grass, and wild oars.

Much of the original habitat of recurved larkspur has been lost to agriculture. Many of the historic populations have either been extirpated or lack modern field confirmations. Most extant populations occur in the lower foothills of the western San Joaquin Valley, and are usually found on north-facing slopes.

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**Attachment 2.3-3**

**Revised Section 8.2.1.3 (Wildlife)**

**from AFC**



## Attachment 2.3-3

## Revised Section 8.2.1.3 (Wildlife) from AFC

**8.2.1.3 Wildlife**

**General Wildlife.** The ruderal vegetation near the project site could provide marginal habitat for a variety of birds, mammals, and reptiles. Bird species include the red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), burrowing owl (*Athene cunicularia*), and western meadowlark (*Sturnella neglecta*). Mammals occupying this habitat type include the black-tailed hare (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), kangaroo rat (*Dipodomys* spp.), deer mouse (*Peromyscus maniculatus*), kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), bobcat (*Felis rufus*), and American badger (*Taxidea taxus*). Amphibians and reptiles include the western toad (*Bufo boreus*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus Tigris*), and gopher snake (*Pituophis melanoleucus*).

**Economically Important Species.** One gamebird species, the mourning dove (*Zenaida macroura*), potentially occurs at the proposed HPP site. This species has some recreational value to hunters, but has no important economic value. No species of economic importance occur in the HPP area.

**Biologically Sensitive Areas.** The HPP project lies outside of any biologically sensitive area. However, the Naval Air Station (NAS) Lemoore wastewater treatment pond area is approximately 0.5 miles east of the HPP site (Figure 8.2-3). The treatment pond area supports over 124 species of animals, including several federally listed birds. A list of these birds has been requested and will be supplied during discovery. Construction and operation of the HPP will have no significant impact on these sensitive bird species or other wildlife in the NAS Lemoore wastewater treatment pond area.

**Attachment 2.3-4**

**Revised Table 8.2-1**

**(Special Status Species with Potential to  
Occur in the Vicinity of the HPP Site)**

**Table 8.2-1**  
**Special-Status Species with Potential to Occur in the Vicinity of the HPP Site**

Species	Status Federal/State/ CNPS	Habitat
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	T/-/-	Associated with blue elderberry
<i>Branchinecta longiantenna</i> Longhorn fairy shrimp	-/E/-	Intermittent wetlands, vernal pools
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	-/E/-	Intermittent wetlands, vernal pools
<i>Lepidurus packardii</i> Vernal pool tadpole shrimp	-/T/-	Intermittent wetlands, vernal pools
<i>Ambystoma californiense</i> California tiger salamander	-/CSC/-	Intermittent wetlands, vernal pools
<i>Gambelia sila</i> Blunt-nosed leopard lizard	E/E/-	Open saltbush scrub and grassland habitats, roads, and open washes
<i>Thamnophis gigas</i> Giant garter snake	T/T/-	Freshwater marsh, low-gradient streams, adapted to drainage canals and irrigation ditches
<i>Athene cunicularia</i> Burrowing owl	-/CSC/-	Valley grasslands and open saltbush scrub
<i>Lanius ludovicianus</i> Loggerhead shrike	-/CSC/-	Valley grasslands and saltbush scrub
<i>Buteo swainsoni</i> Swainson's hawk	-/T/-	Open grassland or cropland with scattered trees
<i>Dipodomys nitratoide nitratoide</i> Tipton kangaroo rat	E/E/-	Western and southern side of the San Joaquin Valley, saltbush scrub, and other alluvial plain and low foothill habitats
<i>Dipodomys nitratoide exilis</i> Fresno kangaroo rat	E/E/-	Alkali sink, open grassland
<i>Onychomys torridus tularensis</i> Tulare grasshopper mouse	-/CSC/-	Scrub and grassland habitats on the west side of the San Joaquin Valley
<i>Perognathus inornatus</i> San Joaquin pocket mouse	-/CSC/-	Open habitats in the San Joaquin Valley
<i>Taxidea taxus</i> American badger	-/CSC/-	Grassland and scrub habitats of the San Joaquin Valley and surrounding foothills
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	E/T/-	Grassland and scrub habitats of the San Joaquin Valley and surrounding foothills
<i>Cirsium crassicaule</i> Slough thistle	FSC/-/1B	Wet areas
<i>Delphinium recurvatum</i> Recurved larkspur	FSC/CSC/1B	Alkali sink, frequently with spiny saltbush
<i>Caulanthus californicus</i> California jewelflower	E/-/4	Open, sparsely vegetated areas in saltbush scrub and grassland

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E = Endangered  
T = Threatened  
FSC = Federal Species of Concern  
CSC = California Species of Concern  
CNPS = California Native Plant Society  
1B = Rare or endangered in California and elsewhere  
4 = Plants of limited distribution

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**Attachment 2.3-5**

**1:6,000 Scale Map of HPP Site and its  
Surrounding Areas**

**Attachment 2.3-6**

**Revised Section 8.2.2.1 (Survey Methodology)**

**from AFC**

## Attachment 2.3-6

## Revised Section 8.2.2.1 (Survey Methodology) from AFC

**8.2.2.1 Survey Methodology**

Surveys at the HPP site were conducted by William J. Vanherweg and Christine O'Rourke on April 20 and May 22, 2001. The surveys were conducted primarily for listed plant and animal species, following methodologies approved by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) (CDFG, 1990). Surveys were performed concurrently for other special-status plant and wildlife species with potential to occur in the area. This section provides a discussion of the survey methodology used during the field review of the project site and the natural gas pipeline and transmission line corridors.

The HPP site and natural gas pipeline and transmission line corridors were surveyed by walking 50-foot-wide transects in suitable species habitat. An additional buffer zone (1,000 feet on either side of the corridors and around the facility) was also surveyed (Figure 8.2-2). Mr. Vanherweg and Ms. O'Rourke compiled a list of all animal and vascular plant species observed in the survey (see Table 8.2-2). As part of the survey, Mr. Vanherweg and Ms. O'Rourke searched for evidence of San Joaquin kit fox potential and known dens, Tipton kangaroo rat burrows, burrowing owl burrows, suitable blunt-nosed leopard lizard habitat, and locations of other sensitive resources. If they had found such evidence, they would have marked the locations in the field with terminal wire pin flags and mapped the location on a site map. However, no such evidence was identified.

The San Joaquin kit fox dens were classified according to the following USFWS kit fox den definitions (USFWS, 1989):

- *Known Den:* Any existing natural den or man-made structure for which conclusive evidence or strong circumstantial evidence can show that the den is used or has been used at any time in the past by a San Joaquin kit fox.

- *Potential Den:* Any natural den or burrow within the range of the species that has entrances of appropriate dimensions (4 to 12 inches in diameter) to accommodate San Joaquin kit foxes, but for which there is little to no evidence of kit fox use.
- *Pupping Den:* Any known San Joaquin kit fox den (as defined above) used by kit foxes to whelp and/or rear their pups.
- *Atypical Den:* Any known San Joaquin kit fox den that has been established in, or in association with, a man-made structure.



**Attachment 2.3-7**

**Resume of Christine O'Rourke**

## CHRISTINE K. O'ROURKE

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*Associate Biologist*

Ms. O'Rourke is an ecologist with extensive experience in field and laboratory techniques. She has performed research at field sites throughout the deserts of California and Arizona. Her responsibilities on ESA projects include conducting threatened and endangered species surveys and habitat assessments, evaluating the impacts of biological resources at individual sites where development has been proposed, writing CEQA/NEPA documents, and monitoring biological resources during project construction.

### EDUCATION

B.S., Evolution and Ecology with English Minor, University of California-Davis  
Biology / English and American Studies coursework, University of East Anglia,  
Norwich, England  
Wetland Delineation Certification Training, U.S. Army Corps of Engineers

### PROFESSIONAL EXPERIENCE

- Performed preliminary analysis of regulatory and other environmental issues associated with construction of a power line through Humboldt, Trinity, and Shasta Counties, identified potential special status species occurring in project area and at proposed power plant location at Humboldt Bay, identified potential regulatory (Section 316 of the Clean Water Act, National Pollutant Discharge Elimination System requirements, and state and regional water quality plans) and biological issues with thermal and stormwater discharge into adjacent waters.
- Surveyed Monterey Airport property and surrounding areas for *Piperia yadonii*.
- Performed USFWS protocol level surveys for California red-legged frog (*Rana aurora draytonii*) within multiple flood control channels for Alameda County Flood Control District Zone 7.
- Conducted surveys and habitat assessments throughout the San Joaquin Valley for pipeline and power line expansion projects. Species studied include San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*), American badger (*Taxidea taxus*), Loggerhead shrike (*Lanius ludovicianus*), and Burrowing owl (*Athene cunicularia*).
- Conducted rare plant surveys along power lines in Bakersfield. Species surveyed include *Eriastrum hooveri*, *Stylocline citroleum*, *Delphinium gypsophilum* ssp. *parviflorum*, and *Eschscholzia lemmonii* ssp. *kernensis*.
- Performed biological assessment and impact analysis for construction of two fiber optic network projects: Metromedia Fiber Network Services (San Francisco Bay Area, Los Angeles Basin Region, Sacramento and San Diego), and Sigma Networks (San Francisco Bay Area, Los Angeles Basin Region). Responsibilities also include writing Biology section of CEQA documents and supplemental requests to the CPUC for variances from the original documents.

**PROFESSIONAL  
EXPERIENCE  
(CONTINUED)**

- Biological monitor for fiber optic cable installation on three large-scale projects: Level (3) Communications (Central Valley); AT&T Fiber Optic Replacement Project (Dunnigan to Manchester [Mendocino County]); Metromedia Fiber Network Services (San Francisco Bay Area). Responsible for crew supervision and training, worker education, construction monitoring, resolving compliance and non-compliance issues, and conducting pre-construction biological surveys.
- Research Assistant, Leitner Biological Consulting. Performed field studies of Mohave ground squirrel (*Spermophilus mojavensis*), set and checked live traps, handled small mammals, assisted with passive integrated transponder (PIT) tag marking, identified and sampled woody shrubs and herbaceous vegetation on study site.
- Laboratory/Research Assistant, Chesson Lab, UC Davis. Participated in field sampling at Chihuahuan Desert research site, designed and executed lab experiments on desert winter annual plant species, identified plant seedlings, collected and compiled data, performed independent research tasks and prepared reports, and organized and maintained lab facility.

**PROFESSIONAL  
AFFILIATIONS**

The Wildlife Society  
California Native Plant Society – East Bay Chapter

**Attachment 2.3-8**

**CNDDB Forms**

**Attachment 2.3-9**

**Sensitive Species Awareness Education Program**

## **HENRIETTA PEAKER PROJECT'S SENSITIVE SPECIES AWARENESS EDUCATION PROGRAM**

The Henrietta Peaker Project's Sensitive Species Awareness Education Program will consist of tail-gate sessions designed to inform personnel about applicable laws and regulations, worker responsibilities during construction and operation, and summaries of the natural histories of the sensitive species that will be impacted by the Henrietta Peaker Project. The specific content of the sessions are describe below.

### **INTRODUCTION**

The Henrietta Peaker Project is committed to build and operate this facility in compliance with federal and state environmental laws and regulations. We have been issued federal and state permits that mandate mitigation measures designed to minimize our project's impacts on sensitive species and their habitats. Following these measures is everyone's responsibility.

The following federal and state laws will be discussed:

- Migratory Bird Treaty Act
- Federal Endangered Species Act
- California Endangered Species Act
- California Department of Fish and Game Code

The Henrietta Peaker Project was designed to avoid impacts that would be in violation of these laws, which is the case with the Migratory Bird Treaty Act, or seek permits to lawfully allow take when impacts cannot be avoided. The Henrietta Peaker Project has agreed to compensate for sensitive habitats that will be permanently or temporarily disturbed and minimize impacts to individual animals that inhabit the project area. The minimization measures listed below are the most important elements of our program and everyone working on the Henrietta Peaker Project must comply with those measures for our project to be successful.

### **WORKER RESPONSIBILITIES**

- Travel on designated roads: Do not travel cross-country in your vehicle at any time. Stay on marked project roads and access routes.
- Obey posted speed limits: This will help to maintain air quality and protect sensitive plants and wildlife.
- Stay in the designated work area: The boundaries of the construction area will be clearly marked. Do not go outside this area or disturb anything located beyond the boundaries.
- Do not enter avoidance areas: Avoidance areas are marked by metal stakes and flagging. Protection of sensitive resources is often as simple as avoiding them. For example, we protect sensitive plants and wildlife near the work area by setting up

avoidance areas around them. No one may enter avoidance areas: doing so will be grounds for disciplinary action which can include immediate dismissal and may result in civil and/or criminal penalties.

- Keep a trash container in every vehicle used in the work area and empty it daily at the recycling bins.
- Do not feed wildlife: Feeding wildlife can be harmful to you and the animals.
- If you encounter wildlife that you feel may be harmful, back away slowly and call your supervisor and the Designated Biologist who will determine the appropriate action.
- Report any injured or dead animals to your supervisor or the Designated Biologist.
- Do not pick wildflowers.
- Do not bring pets to the work area: For the safety of your pets and wildlife, leave your pets at home.
- Do not bring firearms to the work area and do not hunt: Firearms and hunting are prohibited.
- Smoke only in designated areas: Designated smoking areas will be identified, well away from flammable materials. Be sure to completely extinguish all smoking materials and dispose of cigarette butts in the receptacles provided.
- Do not build fires.
- Never park a vehicle where a catalytic converter could ignite dry vegetation.
- Keep your construction vehicles and equipment in good operating condition and make sure that emissions control systems are not disabled.
- Do not use or transfer hazardous materials near open water or drainage channels, only in designated areas.
- Never allow dirt or debris to block stream flows or drainage channels.

## **SENSITIVE SPECIES**

The following species occur or have a potential to occur in the project area:

### **Listed Animals**

San Joaquin kit fox

Tipton kangaroo rat

Swainson's hawk

### **Other Sensitive Species**

Loggerhead shrike

White-tailed kite

Burrowing owl

The training session will include photographs and other important information about the sensitive animals that workers may encounter while working on the Henrietta Peaker Project and they will be told that it is important that they report sightings of these animals to their supervisors or the Designated Biologist.

The attached form will be signed by each employee to verify that he or she has received the awareness training.



## **Certificate of Completion**

I certify that I have received training at the educational session prior to beginning work on this project. During that session, I was provided information about the biology, habitat needs, status under the federal and state Endangered Species Acts, and measures being taken for the protection of the threatened and endangered species that occur in the project area. I also received instruction about the need to protect other sensitive plant and animal resources in the project area.

I, the undersigned individual, have read and understand the measures and agree to comply with all provisions of the program. I am aware that I may incur civil and/or criminal penalties if I do not conform to the required measures.

Furthermore, I agree to participate in the Endangered Species Monitoring Program and will record all personal sightings of the species of concern in the project area.

---

Name (Please print)

---

Signature

---

Date of Session

**Instructions:** Fill out this form and give to the class instructor.

### **Henrietta Peaker Project Emergency Contact**

If you see an emergency involving wildlife or habitats in the project area, please contact your supervisor.

**Attachment 2.3-10**

**Letter from U.S. Fish and Wildlife Service**

**(USFWS)**

## **Cultural Resources**

Technical Staff: Paul Shattuck  
Technical Senior: Dale Edwards  
Project Manager: Bob Eller

## **2.4 Cultural Resources**

### **Siting Regulations and Information**

Appendix B (g) (2) (E): In the discussion on mitigation and monitoring prepared pursuant to subsection (g)(1), a discussion of any educational programs proposed to enhance awareness of potential impacts to archeological resources by employees and contractors, measures proposed for mitigation of impacts to known cultural resources, and a set of contingency measures for mitigation of potential impacts to previously unknown cultural resources.

### ***Information Required to Make AFC Conform with Regulations***

*Please provide a plan for cultural resources education and training of construction and supervisory personnel for this project.*

### **RESPONSE 16**

A briefing will be conducted before construction begins to discuss the potential cultural resources in the project area, basic identification of cultural resources, and the protocol to follow in the event of a discovery. Attachment 2.4-1 provides a cultural resource education handout that will be given to all construction crew and construction supervisors involved in the Henrietta Peaker Project. This handout is the plan for the cultural resources education and training to be provided to construction and supervisory personnel.

**Attachment 2.4-1**

**Cultural Resources Education Program for  
Construction Crew and Supervisors**

**Attachment 2.4-1****Cultural Resources Education Program for  
Construction Crew and Supervisors**

GWF Henrietta Peaker Project  
Kings County, California

This training manual outlines the cultural resources education program for the Henrietta Peaker Project (HPP) construction in Kings County, California.

A pre-construction/excavation cultural resource training briefing will be given to appropriate construction personnel. This training will be given by the project Cultural Resources Specialist (CRS) or other cultural resources personnel approved by the CEC. It is anticipated that construction personnel brought onto the HPP project after initial excavation commencement, including construction supervisors, project managers, and any other workers who operate—or will operate—ground moving equipment, or working on-site in any other capacity, will be given this handout. The cultural resources training will be at two week intervals (if new personnel who have not previously received in-person cultural resources training for the HPP are brought on to the project during the intervening period) thereafter until ground disturbance is concluded at the site. All personnel will be required to sign a form that indicates they have received the handout and understand all provisions set forth in that document.

**Cultural Resources Information**

The material by-products of human activity are called cultural resources. Cultural resources encompass the range of physical objects, sites and structures that are either the direct result of

intentional or inadvertent human actions. For example, the foundations of a building are the remnants of an intentional human activity - the building of a structure. The scraps of bone left behind in a firepit are also cultural resources, but they were in all likelihood left behind as an unintentional act. Both are cultural resources and both, when properly studied, can contribute to our understanding of past human activity.

An archaeologist is a researcher who seeks to learn about past human activities by studying what was left behind. The role of an archaeologist is not unlike that of a detective. By studying the full range of cultural resources in an archaeological site, the archaeologist can begin to piece together a story of past activity at a particular location.

Unlike the historian, who relies primarily on a written record of events, the archaeologist must rely, in part, on the physical evidence itself. This is not always a disadvantage for the archaeologist. For example, the historical accounts of the famous Pony Express mail route established in the 1860s describe the strict prohibition of alcohol at Pony Express stations. Many historical accounts assumed this prohibition of alcohol at the stations to be factually correct. A “Boy Scout” portrayal of those who worked for the Pony Express was not uncommon. When two of the stations were excavated by archaeologists 100 years later, the researchers discovered that the most common artifact were glass containers that held whisky and wine! In this case the archaeologist was able to correct and add to the historical record.

### **Why Is Any of This Important?**

Most people are interested in the past. Each year millions of tourists visit museums, historical sites and archaeological sites with an honest desire to learn more about our past. Human curiosity with the past is not just a recent phenomenon. Many prehistoric archaeological sites contain artifacts dating from even earlier cultures. Apparently, these earlier objects were viewed as curiosities worth saving. Perhaps it’s as simple as “...understanding who we were, helps us understand who we are.” However, like many other resources found on our planet, cultural resources are non-renewable. Put more bluntly, once these resources are destroyed, they are lost

forever. Not only will the physical objects be lost, but also a fragment of our collective history will be gone.

### **Potential Types of Cultural Resources in the Project Area**

Native Americans may have been in the project area 10,000 years ago or more. Surface surveys have been completed for all the project areas. While no prehistoric archaeological sites were located within the project area, a few prehistoric sites that were settlements or temporary camps have been previously documented within a few miles of the project APE. Finds related to these or other Native American sites also might be discovered during the HPP construction. Artifacts could include flint arrowheads, blades or grinding tools such as pestles or mortars. Features such as hearths, living surfaces, or food preparation areas might also appear. Beads have also been found at many Native American archaeological sites in the region. Subsurface construction activity or grading could also uncover burials related to both the historic and prehistoric periods.

While no standing historic sites have been found within the project APE it is possible that artifacts from the historic period could be found below the surface. Bottles, cans, machinery, tools, or various other artifacts intended for trash 50 years ago, may now have the potential to contribute to our understanding of local and regional history. Although not anticipated, buried structural remains might also be found within the APE. Some of these might be remnants from unrecorded historical buildings, or even more mundane structures such as wells or privies.

### **Laws and Regulations That Protect Cultural Resources**

In the United States, these fragile and nonrenewable cultural resources have been legally recognized on the federal, state, and in some cases, local levels. Such resources, if found to be significant, are protected by laws and regulations to ensure that truly important resources are preserved or studied before they are destroyed. As early as 1906, the Federal Government formally recognized the importance of some cultural resources with passage of the 1906 Antiquities Act. In 1966, Congress passed the National Historic Preservation Act, which



required all Federal agencies to assess the effects of any agency-sponsored undertaking on cultural resources.

On the California State level, consideration of significance as an "...important archaeological resource" is measured by cultural resource provisions considered under California Environmental Quality Act (CEQA). Section 15064.5 of CEQA assigns special importance to human remains and California Public Resources Code Section 5097.98 and Section 7050.5© of the Health and Safety Code specify procedures to be used when Native American remains are discovered.

California Public Resources Code Section 5097.99 states, in summary, that

- "...No person shall obtain or possess any Native American artifacts or human remains which are taken from a Native American grave or cairn...except as otherwise provided by law..."
- "...Any person who knowingly or willfully obtains or possesses any Native American artifacts or human remains which are taken from a Native American grave or cairn...except as otherwise provided by law...is guilty of a felony which is punishable by imprisonment in the state prison."
- "...Any person who removes, without authority of law, any Native American artifacts or human remains from a Native American grave or cairn with an intent to sell or dissect or with malice or wantonness is guilty of a felony which is punishable by imprisonment in the state prison."

**IMPORTANT: The unauthorized disturbance or collection of cultural resources can result in penalties of up to \$100,000 and 5 years imprisonment.**

### **Procedures in the Event of a Discovery**

The workforce members should always contact the appropriate person when cultural resources are discovered. If you encounter any cultural resources during construction, STOP WORK in the

immediate vicinity of the find and report the find to your supervisor immediately. Your supervisor will then notify the Project Engineer and CRS. Do not resume work until you have been instructed to do so by your supervisor or the CRS.

The construction crew and other project personnel have a vital role in the cultural resources monitoring process and should always be alert for these resources. More often than not, the heavy equipment operators make the first discoveries of cultural finds in undisturbed strata, so it is extremely important that those involved in such activities be aware of the proper procedures to follow in the event of discovery. Key items to look for when in the field are:

1. All soil and deposit changes, such as color or type. A soil color change can indicate a former living surface like a floor, an historical trash deposit, a hearth or food preparation area, building foundations, historical farm or cultivation area, and other activities. Subsurface soil changes or inclusions, such as rocks embedded into a sandy or silty deposit, can indicate areas prepared for structural foundations, or can be the remnants of a campsite fireplace.
2. Presence of charcoal particles in soil. Charcoal, as larger chunks, small flecks, or in thick, black horizontal deposits, might indicate the presence of a hearth or cooking area.
3. Any buried objects or structures. Common prehistoric artifacts include stones used for processing acorns and other plant materials, chipped stone artifacts made of obsidian or chert, and shell beads. Historical cultural resources include bottles, tools, pieces of clothing, coins, dishes, bricks, and numerous glass, metal, and ceramic artifacts. Buried structural remains might include brick wall remains, concrete foundations, or any other features that were once part of a standing structure.

In the event that cultural resources are uncovered during construction the following procedures must be followed:

- Excavation work or any other earth-moving activities within 100 feet must halt/relocate
- The site or area foreman must be notified of the suspected find(s)
- If the finds do not appear to be human remains/burial(s) the CRS will be immediately contacted

**Cultural Resource Recovery and Mitigation Methods**

Various sequences of events could occur upon the discovery of cultural resources. The excavation may proceed with no restrictions if the resources are assessed as insignificant by a qualified archaeologist. Sometimes, the excavation may proceed with caution and enhanced recordation of the cultural resources, or excavations may proceed if there will be no further damage the find. In the last two cases, the excavation will not be backfilled until enhanced recordation of the find is completed. Finally, the excavation might be halted or redirected in the immediate area until agency consultation is complete and proper mitigation plans have been arranged. Ask the CRS or your supervisor when there is any doubt about whether the work can proceed.

In certain cases, the CRS or a cultural resource monitor (CRM) might need to view a trench or profile in order to assess the finds or make more thorough recordation. Coordinate these activities with the cultural resources personnel. Do not continue excavations until the CRS/CRM has given permission to proceed. Cultural resources might need to be sampled, or other cultural resources team members might still be in the trench.

**Human Remains**

There is always the potential for encountering human skeletal remains. If the finds do appear to be human remains/burial(s):

1. All excavation activities within 100 feet will immediately stop and the area will be protected with flagging or by posting a monitor or construction worker to assure no additional disturbance occurs; if the find occurs at the end of the work day, the area must be secured by plating, or covering with other impervious material to preclude vandalism.
2. The CRS/CRM, if not present, must be contacted immediately to determine if the remains are potentially human; if potentially human the CRS/CRM will

immediately notify the Project Owner or his designated representative who will contact the County Coroner first and then the CPM.

3. The Coroner will have two working days to examine the remains after being properly notified.
4. Work will not continue in that area until the Project Owner, and/or CRS has been properly notified by the Coroner as to whether or not the remains are considered prehistoric (not a crime scene).
5. If the Coroner determines that the remains are not subject to his or her authority and if the Coroner recognizes the remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she will contact by telephone within 24 hours the Native American Heritage Commission.
6. Under typical circumstances, the Most Likely Descendent(s) (MLD) of the discovered remains will then be contacted by the NAHC. The MLD has 24 hours to make recommendations to the project owner regarding treatment and disposition of the identified remains

**KINGS COUNTY CORONER: (559) 582-3211**

### **Summary – Your Responsibilities**

- When operating in the designated construction areas, all crewmembers should always keep an eye open for these resources. This vigilance should occur even in areas that look previously disturbed.
- If suspicious finds do appear during construction, immediately halt the excavation activities in the immediate vicinity of the discovery.
- Contact the CRS/CRM to verify that the finds are in fact significant cultural resources.

- If the CRS or CRM cannot be immediately located, then contact the construction supervisor. Only the CRS or qualified monitors are authorized to identify the resources and to assess whether the resource is significant.
- Cultural resources and human remains are protected under state and Federal law. The unauthorized removal or intentional disturbance of these resources can result in a fine and imprisonment.

#### **Key Contacts**

<b>CRS</b>	<b>Brian Hatoff</b>	<b>510-874-3195</b> <b>510-682-3343 (cell)</b>
<b>Alt. CRS</b>	<b>Bryon Bass</b>	<b>510-874-3235</b> <b>415-225-6590 (cell)</b>

## Land Use

Technical Staff: Mark R. Hamblin  
Technical Senior: Eileen Allen  
Project Manager: Bob Eller

## 2.5 Land Use

### Siting Regulations and Information

Appendix B (g) (1): ...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.

### *Information Required to Make AFC Conform with Regulations*

*Discuss the direct and cumulative impacts of the loss of farmland of statewide importance farmland, including the potential for this project to induce agricultural land conversion, and overall urban growth on surrounding parcels. We suggest using the California Department of Conservation's Agricultural Land and Site Assessment Model (LESA) to characterize the loss of farmland of statewide importance. Contact Eric Vink at the Dept. of Conservation at (916) 324-0859. Discuss measures for mitigating the loss of farmland of statewide importance.*

### RESPONSE 17

GWF proposes to contribute funds to the American Farmland Trust for the procurement of conservation lands on a 1:1 basis within Kings County, if possible, or otherwise within areas that are in close proximity to the County. With this mitigation there are no direct or cumulative impacts from the HPP.

### SB 28 Sher Requirements and Information

§25552(e)(1) (All): [a]ssure that the thermal powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;

### *Information Required to Make AFC Conform with Regulations*

*Discuss the direct and cumulative impacts of the loss of farmland of statewide importance, including the potential for this project to induce agricultural land conversion, and overall urban growth on surrounding parcels. We suggest using the California Department of Conservation's Agricultural Land and Site Assessment Model (LESA) to characterize the loss of farmland of statewide importance. Contact Molly Penberth at the Dept. of Conservation at (916) 324-0859. Discuss measures for mitigating the impact of the loss of farmland of statewide importance. The response to App.B item (g)(1) will meet this requirement.*

**RESPONSE 18**

See Response 17.



## **Project Overview**

Technical Staff: Bob Eller  
Technical Senior: Paul Richins  
Project Manager: Bob Eller

## **2.6 Project Overview**

### **SB 28 Sher Requirements and Information**

§25552(e)(5)(A) (Project Overview): [t]hat the thermal powerplant will cease to operate and the permit will terminate within three years.

### **Information Required to Make AFC Conform with Regulations**

*Applicant requests waiver of requirement. Pending legislation may also waive requirement.*

### **RESPONSE 19**

GWF Energy LLC has entered into a contract with California Department of Water Resources to meet the State's critical electricity needs. The contract requires that power from the project be supplied for a 10-year period. Accordingly, GWF Energy LLC has requested that the 3-year limitation be waived. This waiver would be consistent with both the spirit and the intent of the Governor's executive orders. It is our understanding that CEC legal staff have proposed that the granting of this waiver be placed on the agenda for the October 17, 2001, business meeting of the California Energy Commission.

## **Public Health**

Technical Staff: Alvin Greenberg  
Technical Senior: Mike Ringer  
Project Manager: Bob Eller

## 2.7 Public Health

### Siting Regulations and Information

Appendix B (g) (1): ...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.

### Information Required to Make AFC Conform with Regulations

*Public health impacts due to pre-construction site preparation and construction equipment diesel exhaust must be provided as well as proposed mitigation.*

### RESPONSE 20

An analysis of long-term health risks associated with particulate matter from diesel-fueled construction equipment was performed. This analysis included additional mitigation for construction equipment beyond that described in Condition of Certification AQ-C3 in Appendix K5 of the AFC. Revised Condition of Certification AQ-C3 (see Attachment 2.1-7) involves the use of catalyzed diesel particulate (soot) filters on construction equipment rated at 100 brake-horsepower (bhp) or greater. Documentation from the U.S. Environmental Protection Agency (June 2, 2000, 65 Federal Register, 35429) and the California Air Resources Board ([www.arb.gov/diesel/ss/Eval\\_Index.htm](http://www.arb.gov/diesel/ss/Eval_Index.htm)) indicates that the 90% control that results from these diesel particulate filters is a typical level of particulate control.

The estimated particulate matter (PM) emissions from the construction equipment described in the AFC were reduced by 90% for equipment rated at 100 bhp or greater. Revised Condition of Certification AQ-C3 under air quality has been added to provide for this mitigation. The resulting diesel PM emissions were incorporated into the ISCST3 dispersion modeling source files used in the AFC for the estimation of construction equipment PM impacts. The ISCST3 modeling for the meteorological data year of 1968 resulted in a maximum construction equipment PM impact of  $1.88 \mu\text{g}/\text{m}^3$  at the south fence line. The nearest residence (which is closer than the nearest nonresidential sensitive receptor) is located approximately 1.5 miles to the north. This residence had an estimated construction equipment PM impact of  $0.01139 \mu\text{g}/\text{m}^3$  (UTM 239000 east, 4016500 north). Documentation for these calculations can be found in Attachments 2.1-4 and 2.1-5.

Increased lifetime cancer risk and chronic noncancer health impacts were estimated using the California Office of Environmental Health Hazard Assessment (OEHHA) diesel exhaust particulate matter cancer unit risk factor of  $3.0 \times 10^{-4} [\mu\text{g}/\text{m}^3]^{-1}$  and chronic reference exposure level of  $5 \mu\text{g}/\text{m}^3$ . The cancer unit risk factor assumes a 70-year exposure period. Construction is scheduled to occur over a 5-month period (two 10-hour shifts per day). Therefore, for the purposes of assessing a worst-case lifetime cancer risk, the exposure period

was adjusted to a continuous 5-month period. The resulting estimated cancer risk is 3.36 in one million at the south fence line location, and 0.020 in one million at the nearest residence. The estimated chronic noncancer hazard index was calculated as 0.376 at the south fence line location and 0.0023 at the nearest residence, assuming no adjustment to the exposure period. Although the construction period will be only 5 months, as chronic RELs are established from procedures that assume less than 70-year exposures, no exposure adjustment was made for the chronic HI calculation. This is expected to result in a conservative chronic HI estimate.

**SB 28 Sher Requirements and Information**

§25552(e)(1) (All): [a]ssure that the thermal power plant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;

**Information Required to Make AFC Conform with Regulations**

*Public health impacts due to pre-construction site preparation and construction equipment diesel exhaust must be provided as well as proposed mitigation.*

**RESPONSE 21**

See Response 20.

**SB 28 Sher Requirements and Information**

§25552(e)(2) (All): [a]ssure protection of public health and safety; Sec. 8.6.2.7

**Information Required to Make AFC Conform with Regulations**

*See above.*

**RESPONSE 22**

See Response 20.

## **Socioeconomics**

Technical Staff: James Adams  
Technical Senior: Dale Edwards  
Project Manager: Bob Eller

## 2.8 Socioeconomics

### Siting Regulations and Information

Appendix B (g) (7) (A) (iii): Existing and projected unemployment rates;

### Information Required to Make AFC Conform with Regulations

*Please provide projected unemployment rates.*

#### RESPONSE 23

Projected unemployment rates by county in California are not available from the California Employment Development Department, the Kings County Regional Planning Agency, or the California Department of Finance (Funakoshi, 2001; Highfill, 2001; Palada, 2001); however, the unemployment rate for the State of California as a whole is expected to increase to 5.0 percent in 2001, and 5.7 percent in 2002 (CDF, 2001).

### Siting Regulations and Information

Appendix B (g) (7) (A) (iv): Availability of skilled workers by craft required for construction and operation of the project;

### Information Required to Make AFC Conform with Regulations

*Please provide the availability of skilled workers by craft required for construction and operation of the project.*

#### RESPONSE 24

The California Employment Development Department does not categorize the available civilian labor force in Kings, Kern, or Fresno Counties by type of occupation. However, total construction employment in Kings, Kern, and Fresno Counties was over 25,000 in 1999.<sup>1</sup> Using the respective unemployment rates for each county, an estimated 3,911 construction workers are unemployed in the three counties and therefore could be available to work at the plant. If the number of available construction workers (3,911) is divided evenly among the types of workers needed for the project (including operation and the type of construction workers listed in Table 8.8-13 in the AFC), the estimated number of available workers available for each type is higher than the number of required workers by type.

In addition, Table 8.8-5 in the AFC and new Table 8.8-17 list the local union membership near the project site, from which construction and operation workers would be drawn. The number of workers listed as members of the unions in Table 8.8-17 is higher than the required number of workers for the project.

---

<sup>1</sup> Includes Mining employment in Kings and Fresno Counties.

*References:*

California Department of Finance (CDF), 2001. Latest Economic Data. California Forecasts.  
[http://www.dof.ca.gov/HTML/FS\\_DATA/LatestEconData/Forecasts/California.xls](http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/Forecasts/California.xls).

September 6, 2001.

Funakoshi, Tad, 2001. Telephone communication between Tad Funakoshi, California Employment Development Department, and Katie McKinstry, URS Corporation. August 31, 2001.

Highfill, Sydney, 2001. Telephone communication between Sydney Highfill, Kings County Regional Planning Agency, and Katie McKinstry, URS Corporation. September 12, 2001.

Palada, Cecilia, 2001. Telephone communication between Cecilia Palada, California Department of Finance, and Katie McKinstry, URS Corporation. September 6, 2001.



**New Tables for**  
**Section 8.8 (Socioeconomics)**

**Table 8.8-17**  
**Local Union Membership Near HPP Site**

<b>Type of Worker</b>	<b>Number of Workers</b>	<b>Area</b>
Aluminum, Brick, and Glass Workers	200	Central Valley/Fresno
Auto Mechanics, Machinists	1310	From Merced to Bakersfield
Carpenters	1300	Fresno, Tulare, Kings, Madera, Kings, Inyo and Mono counties
General Construction	600	Kings, Inyo and Mono counties
Electrical Workers	620	Fresno, Tulare, Kings, Madera counties
Ironworkers	500	All of Central Valley
Laborers	1125	Fresno, Tulare, Kings, Madera counties
Painters	420	Fresno, Tulare, Kings and Madera counties
Plasterers and Cement Masons	325	Fresno, Tulare, Kings, Madera counties
Plumbers and Steamfitters	600	Fresno, Tulare, Kings and Madera counties
Roofers and Waterproofers	225	Fresno area
Sheet Metal Workers	1,800	Fresno, Tulare, Kings and Madera counties
Teamsters	63	Fresno, Tulare, Kings and Madera counties
<b>TOTAL</b>	<b>9,088</b>	

## **Soil Resources**

Technical Staff: Tony Mediati  
Technical Senior: Dick Anderson  
Project Manager: Bob Eller

## 2.9 Soil Resources

### Siting Regulations and Information

Appendix B (g) (1): ...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.

### Information Required to Make AFC Conform with Regulations

*(1) Please provide information on the intended use of the parcel outside of the 7 acres that are planned for the project.*

*(2) Please provide an estimate of the current soil erosion and a cumulative impact assessment.*

*(3) Please provide information on proposed monitoring efforts to ensure success of mitigation measures, if any.*

*(4) Please discuss any direct, indirect or cumulative impacts associated with the conversion of agricultural land to industrial uses.*

*(5) Page 8.15-8 it is stated “ the loose nature of the soil limits it use for embankments, dikes, and levees.” Please describe what soil will be used for berms and drainage or what steps will be taken to make the soil suitable.*

## RESPONSE 25

(1) It is uncertain what the intended use of the parcel outside of the HPP will be. However, GWF does not intend to remove the remainder of the parcel from agricultural use.

(2) The land in the vicinity of the HPP is currently being used for agricultural purposes. Current wind and water erosion occurs from normal agricultural practices (e.g., rototilling, irrigation). The topographic gradient in the vicinity of the HPP is flat, reducing the probability of a high amount of erosion due to water. According to *Soil Survey of Kings County, California* (Arroues and Anderson, 1986), the susceptibility of the Lethent clay loam to wind erosion is slight and the susceptibility of the soil to water erosion is low. Therefore, the erosion of the soil due to wind and water is estimated to be low.

Cumulative impacts to erosion from the construction of the HPP are expected to be low. During construction, mitigation measures will be implemented (see Response 25(4) below) to minimize erosion impacts from construction.

(3) The mitigation measures include implementing best management practices to minimize soil erosion during construction of the HPP. The mitigation measures and verification/monitoring procedures will be described in the SWPPP for the HPP construction. The construction manager will have the SWPPP onsite and will be responsible for implementing the best management practices. The mitigation will include the use of silt fences, hay bales, dust suppression, and minimizing to the extent practical the area of the site open to erosion at any one time. These measures can be monitored by visual observation, followed by written documentation of the measures taken. As part of the best management practice during construction, and particularly after a rain event, the site and drainages will be inspected for signs of erosion (e.g., excess sediment accumulation in drainage areas). Observations and corrective actions will be documented.

(4) GWF proposes to contribute funds to the American Farmland Trust for the procurement of conservation lands on a 1:1 basis within Kings County, if possible. With this mitigation there are no direct or cumulative impacts from the HPP.

Approximately 13 acres will be affected by the HPP, and approximately seven acres will be permanently affected by the HPP project. The HPP site and proposed natural gas pipeline are not located on prime farmland, but they are located on farmland of state importance. There are 429,172 acres of farmland of state importance in Kings County (Soil Conservation Service, 1998). Only eight acres out of 429,172 acres, or 0.0019 percent, will be permanently converted to industrial use. Therefore, a very small percentage of farmland of statewide importance in Kings County will be permanently converted to industrial use by the HPP.

(5) A stormwater runoff pond will be constructed as part of the HPP. The sides of the runoff pond will be cut on slopes to be specified by the geotechnical report. Topsoil will be spread on the slopes and bottom of the pond, and all surfaces will be seeded, fertilized, mulched, and watered to establish a vegetative cover to protect against erosion. The grass seed will be selected in accordance to the California Department of Transportation (DOT) specifications for that region. All other surfaces around the pond will be treated the same way unless covered with aggregate surfacing, concrete paving, or asphalt paving.

### **Siting Regulations and Information**

Appendix B (g) (15) (C): An assessment of the effects of the proposed project on soil resources and agricultural land uses. This discussion shall include:

#### **Information Required to Make AFC Conform with Regulations**

*Please provide an assessment of the effects of the proposed site preparation and construction activities (grading, excavation, grubbing, revegetation, berm, cut, fill, trenching, etc..) on soil uses and agricultural lands.*

### **RESPONSE 26**

The HPP site and proposed natural gas pipeline will be located on Lethent clay loam soil. In Kings County, there are a total of 50,127 acres of Lethent clay loam (Arroues and

Anderson, 1986). Therefore, the HPP will be permanently affecting only seven acres out of 50,127 acres of Lethent clay loam, or 0.016 percent of the total amount of Lethent clay loam in Kings County.

Impacts to soil uses and agricultural lands from grading, excavation, grubbing, etc., will be minimal. Only 0.016 percent of the total Lethent clay loam in Kings County will be permanently affected by the construction of the HPP site and the proposed natural gas pipeline. In addition, as stated in Response 25(4) above, only 0.0019 percent of the total farmland of state importance in Kings County will be affected by the HPP.

In addition to the seven acres of permanent disturbance, five acres of land will be affected by construction activities. Once construction is complete these areas will be restored to their current use.

### **Siting Regulations and Information**

Appendix B (g) (15) (C) (i): The quantification of accelerated soil loss due to wind and water erosion;

### **Information Required to Make AFC Conform with Regulations**

*Please provide the quantification of accelerated soil loss due to wind and water erosion.*

### **RESPONSE 27**

As stated in the AFC, the soil loss potential from erosion was not calculated because the construction activities would employ mitigation and sedimentation/erosion controls to minimize soil erosion. Mitigation measures are outlined in the AFC and will be described as best management practices in the SWPPP for the construction of the HPP. The construction manager will have the SWPPP onsite during the construction activities. Verification/monitoring of the BMPs will be conducted as described in Response 25.

### **Siting Regulations and Information**

Appendix B (g) (15) (C) (iii): The effect of power plant emissions on surrounding soil-vegetation systems.

### **Information Required to Make AFC Conform with Regulations**

*Please provide an assessment of the effects of the plant's emissions on surrounding soil vegetation systems.*

### **RESPONSE 28**

To assess the project's potential impacts on soils and vegetation in the immediate project area, maximum modeled NO<sub>2</sub> and SO<sub>2</sub> concentrations from the proposed combustion sources, as well as estimates of total nitrogen and sulfur deposition from these modeled concentrations, were compared against thresholds for significant impacts to vegetation and

ecosystems published by the U.S. Forest Service (USFS, 1992) for Class I Wilderness Areas. The soils and vegetation in the project area are not as sensitive as the ecosystems being protected by these sensitive USFS threshold levels.

For SO<sub>2</sub>, the USFS guidance states that maximum SO<sub>2</sub> concentrations below 40 parts per billion by volume (ppbv) and annual average SO<sub>2</sub> concentrations below 8 ppbv will maximize protection of all California plant species. The results of the air dispersion modeling presented in Section 8.1 of the AFC (Table 8.1-19) were 11.7 µg/m<sup>3</sup> (4.4 ppbv) for a one-hour concentration and less than 0.01 µg/m<sup>3</sup> (<0.01 ppbv) on an annual average at maximum impact locations. Both of these values are well below the USFS significance levels. As for NO<sub>2</sub>, the guidance recommends that annual NO<sub>2</sub> concentrations below 15 ppbv are protective of California plant species. The dispersion modeling results presented in Table 8.1-19 of the AFC show the maximum annual NO<sub>2</sub> concentration due to the project to be 0.02 µg/m<sup>3</sup> (0.01 ppbv), which is again well below the USFS significance level.

The USFS guidance also presents significance thresholds for impacts to soils due to total nitrogen and sulfur deposition. For the purposes of this assessment, it was assumed that at the locations of maximum modeled NO<sub>2</sub> and SO<sub>2</sub> all of the nitrogen and sulfur in these gases convert to elemental nitrogen and sulfur in the particulate phase and deposit on the ground at these locations. This, of course, is extremely conservative, as this would not physically occur. This calculation was performed by multiplying the maximum modeled airborne concentrations by a deposition velocity factor of 0.02 meters per second, which is consistent with the methodology used by the California Air Pollution Control Officers Association (CAPCOA) for estimating potential health risks due to deposition from sources of toxic PM<sub>10</sub> emissions (CAPCOA, 1993).

For total sulfur deposition, the USFS guidance states that an annual value of five kilograms per hectare per year (kg/ha-yr) is protective from potential toxic effects. (A hectare is an area of 10,000 square meters.) For total nitrogen deposition, the USFS guidance gives a no-injury value of three kg/ha-yr. The modeled annual SO<sub>2</sub> concentration of less than 0.01 µg/m<sup>3</sup> and annual NO<sub>2</sub> concentration of 0.02 µg/m<sup>3</sup> yields total sulfur and nitrogen deposition estimates of <0.03 kg/ha-yr and 0.04 kg/ha-yr, respectively, at the maximum impact locations:

S deposition:

$$<0.01 \mu\text{g}/\text{m}^3 \times (32 \text{ g S}/64 \text{ g SO}_2) \times 0.02 \text{ m/s} \times (3.1536 \times 10^7 \text{ s/yr}) \times 10^{-5} (\text{kg/ha})/(\mu\text{g}/\text{m}^2) = <0.03 \text{ kg/ha-yr}$$

N deposition:

$$0.02 \mu\text{g}/\text{m}^3 \times (14 \text{ g N}/46 \text{ g NO}_2) \times 0.02 \text{ m/s} \times (3.1536 \times 10^7 \text{ s/yr}) \times 10^{-5} (\text{kg/ha})/(\mu\text{g}/\text{m}^2) = 0.04 \text{ kg/ha-yr}$$

With the extremely conservative assumptions employed, both values are below the applicable USFS thresholds. In summary, the maximum modeled airborne concentrations of NO<sub>2</sub> and SO<sub>2</sub> from the combustion sources at the proposed Henrietta Peaker Project results in potential gaseous concentrations and total nitrogen and sulfur deposition values well below levels of concern for California plants and soils in Class I Wilderness Areas, as published by the USFS. The soils and vegetation in the project area are not as sensitive as the ecosystems being protected by these sensitive USFS threshold levels. Thus, the plant's emissions will have an insignificant impact on surrounding soil-vegetation systems.

*References:*

California Air Pollution Control Offices Association. 1993. Air Toxics “Hot Spots” Program, Revised 1992 Risk Assessment Guidelines.

U.S. Forest Service (USFS). 1992. *Guidelines for evaluating air pollution impacts on Class I wilderness areas in California*. General Technical Report PSW-GTR-136.

**SB 28 Sher Requirements and Information**

§25552(e)(1) (All): [a]ssure that the thermal powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;

**Information Required to Make AFC Conform with Regulations**

*For mitigated measures stated, please provide proposed verification measures to ensure that the powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation. If creeks, sloughs or drainages are crossed, please provide a description of the proposed conditions of certification that will ensure the construction of linear facilities will not have a significant adverse effect on the environment.*

**RESPONSE 29**

Creeks, sloughs, or drainages will not be crossed by linear facilities.

**SB 28 Sher Requirements and Information**

§25552(e)(3) (All): [r]esult in compliance with all applicable federal, state, and local laws, ordinances, and standards;

**Information Required to Make AFC Conform with Regulations**

*If creeks, sloughs or drainages are crossed, please provide information on laws, regulations, ordinances, standards or permits that may be required.*

**RESPONSE 30**

Creeks, sloughs, or drainages will not be crossed.



## **Traffic and Transportation**

Technical Staff: Tambllyn Borton  
Technical Senior: Eileen Allen  
Project Manager: Bob Eller

## **2.10 Traffic and Transportation**

### **Siting Regulations and Information**

Appendix B (g) (5) (A): A regional transportation setting, on topographic maps (scale of 1:250,000), identifying the project location and major transportation facilities. Include a reference to the transportation element of any applicable local or regional plan.

### **Information Required to Make AFC Conform with Regulations**

*This item requires a map at a scale of 1:250,000 rather than the 1:500,000 provided. However, since the map provided does show the major roads in the region, it will be adequate when the key highways (e.g. SR 198) used to access the site are clearly labeled, and the rail line item below is added. Provide clear labels for the railroads in the area which reflect the current ownership, such that the map is consistent with the text references on p 8.10-2 and 8.10-7 (e.g. the Union Pacific line).*

### **RESPONSE 31**

Revised Figure 8.10-1 is attached.

### **Siting Regulations and Information**

Appendix B (g) (5) (B): An identification, on topographic maps at a scale of 1:24,000 and a description of existing and planned roads, rail lines, including light rail, bike trails, airports, bus routes serving the project vicinity, pipelines, and canals in the project area affected by or serving the proposed facility. For each road identified, include the following information, where applicable:

### **Information Required to Make AFC Conform with Regulations**

*If appropriate, add the Union-Pacific rail line to Fig.10-2, since Fig.10-1 shows it crossing the highway that appears to be SR 198 in the project vicinity.*

### **RESPONSE 32**

Revised Figure 8.10-2 is attached.

### **Siting Regulations and Information**

Appendix B (g) (5) (B) (v): Estimated percentage of current traffic flows for passenger vehicles and trucks; and

**Information Required to Make AFC Conform with Regulations**

*Applicant doesn't provide truck traffic percentages for local roadways, as noted on p.8.10-7. Please document the unavailability of this data through a record of conversation with the Kings County Public Works Department staff.*

**RESPONSE 33**

Truck traffic percentages have been provided in the fifth column of Table 8.10-2 in the AFC. Annual average daily truck traffic and traffic counts are not available. (Telephone conversation with Anthony Gomez, Road Superintendent, Kings County Public Works Department, Roads Division, 559-582-3211, extension 2694, June 7, 2001.).

**Siting Regulations and Information**

Appendix B (g) (5) (B) (vi): An identification of any road features affecting public safety.

**Information Required to Make AFC Conform with Regulations**

*Specify the road features, or lack thereof, that would affect public safety.*

**RESPONSE 34**

There are no road features that would impact public safety.

**Siting Regulations and Information**

Appendix B (g) (5) (C): A description of any new, planned, or programmed transportation facilities in the project vicinity, including those necessary for construction and operation of the proposed project. Specify the location of such facilities on topographic maps at a scale of 1:24,000.

**Information Required to Make AFC Conform with Regulations**

*Provide a 1:24,000 scale topographic map of new, planned, or programmed transportation facilities.*

**RESPONSE 35**

Planned transportation improvements within 15 miles of the project site are shown on new Figure 8.10-3. The improvements are as follows:

- (1) **SR 198 at 19th Ave.** Construction of an interchange, estimated to be completed by 2006.

**Note:** As explained in Section 8.10.3.2 of the AFC, it is expected that HPP construction traffic will travel along SR 198 at this location. However, the

construction period for the interchange will not coincide with construction of the HPP.

- (2) **SR 41 at Grangeville Blvd.** Construction of an interchange, estimated to be completed by 2015.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is expected that HPP construction traffic will travel along SR 41 at this location. However, the construction period for the interchange will not coincide with construction of the HPP.

- (3) **18th Avenue from Kansas Ave. to Jackson Ave.** Pavement overlay (rehabilitation) to be completed by 2001.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is not expected that HPP construction traffic will travel along 18<sup>th</sup> Ave. to access the HPP site. Also, the pavement rehabilitation will likely be completed before construction of the HPP begins.

- (4) **Grangeville Boulevard from SR 41 to 18th Ave.** Pavement overlay (rehabilitation) to be completed by 2002.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is not expected that HPP construction traffic will travel along Grangeville Blvd. to access the HPP site.

- (5) **Jackson Avenue from 11th Ave. to 17th Ave.** Pavement overlay (rehabilitation) to be completed by 2002.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is not expected that HPP construction traffic will travel along Jackson Ave. to access the HPP site.

- (6) **Laurel Avenue from 18th Ave. to 20th Ave.** Pavement overlay (rehabilitation) to be completed by 2001.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is not expected that HPP construction traffic will travel along Laurel Ave. to access the HPP site. Also, the pavement rehabilitation will likely be completed before construction of the HPP begins.

- (7) **Laurel Avenue from Avenal Cutoff Rd. to SR 41.** Pavement overlay (rehabilitation) to be completed by 2002.

*Note:* As explained in Section 8.10.3.2 of the AFC, it is not expected that HPP construction traffic will travel along Laurel Ave. to access the HPP site.

A Note Concerning Figure 8.10-3: Due to the fact that most of the above-listed transportation improvements are several miles from the HPP site, it was impossible to display the locations of the improvements on a single topographic map at the 1:24,000 scale specified by CEC guidelines. This large scale would require several individual maps to cover a 15-mile radius around the HPP site.

Because of the smaller scale required to display a 15-mile radius around the HPP site on a single map, it was necessary to use a streets and roads base map rather than a topographic base map to display the locations of the transportation improvements. At the required smaller scale, many local roads could not be identified on a topographic base map.

**Revised and New Figures for  
Section 8.10 (Traffic and Transportation)**



## **Visual Resources**



Technical Staff: Eric Knight  
Technical Senior: Dale Edwards  
Project Manager: Bob Eller

## 2.11 Visual Resources

### Siting Regulations and Information

Appendix B (g) (6) (B): An assessment of the visual quality of those areas that will be impacted by the proposed project.

### Information Required to Make AFC Conform with Regulations

*Please provide concluding statements on the visual quality of the views from each of the KOPs.*

### RESPONSE 36

The visual resources section addresses the parameters of vividness, intactness, and unity for each of the selected key observation points (KOPs). Based on FHWA guidelines, the rating system shown in new Table 8.11-2 can be employed to determine overall visual quality. Overall visual quality is determined by averaging the numerical score of the three parameters to obtain the corresponding overall visual quality rating. New Tables 8.11-3 and 8.11-4 apply the methodology to rate the overall visual quality at each of the KOPs before and after construction of the HPP. As shown in these tables, there are no significant changes to visual quality.

### Siting Regulations and Information

Appendix B (g) (6) (C): After discussions with staff and community residents who live in close proximity to the proposed project, identify the scenic corridors and any visually sensitive areas potentially affected by the proposed project, including recreational and residential areas. Indicate the approximate number of people using each of these sensitive areas and the estimated number of residences with views of the project. For purposes of this section, a scenic corridor is that area of land with scenic natural beauty, adjacent to and visible from a linear feature, such as a road, or river.

### Information Required to Make AFC Conform with Regulations

*The AFC states (page 8.11-3) that two-story houses located at NAS Lemoore (the view represented by KOP 2) would have clear views of the project. Please provide an estimate of the number of residences in the area of KOP 2 that would have views of the project. The AFC describes (page 8.11-2) the Lemoore region of the San Joaquin Valley as an expansive flatland, and that in addition to the residences at NAS Lemoore, residences in the vicinity of the project include scattered ranch style homes. Please discuss whether these residences would have views of the project, and estimate their number.*

### RESPONSE 37

New Table 8.11-5 provides an estimate of the number of residences and traffic volume at each of the KOPs.

It is estimated that there are approximately six ranch style homes within the viewshed that may have views of the site. These homes are more distant than any of the KOPs previously analyzed.

**Siting Regulations and Information**

Appendix B (g) (6) (D): A description of the dimensions, color, and material of each major visible component of the project.

**Information Required to Make AFC Conform with Regulations**

*The AFC states that the project components will be painted in “neutral” colors, but does not specify the color. The photosimulation of the project (Figure 8.11-11) shows the project painted with a light gray color. Please specify the proposed color for the project structures.*

**RESPONSE 38**

The photosimulation is considered an accurate reflection of the intended color for project structures. The proposed paint color for the project is gull-gray.

**New Tables for**  
**Section 8.11 (Visual Resources)**

**Table 8.11-2**  
**Visual Quality Rating System**

<b>Rating</b>	<b>Vividness</b>	<b>Intactness</b>	<b>Unity</b>	<b>Visual Quality</b>
Very high	7	7	7	7
High	6	6	6	6
Moderately high	5	5	5	5
Average	4	4	4	4
Moderately low	3	3	3	3
Low	2	2	2	2
Very low	1	1	1	1

**Table 8.11-3**  
**Baseline Visual Quality at Selected Key Observation Points**

<b>Base Case</b>	<b>Vividness</b>	<b>Intactness</b>	<b>Unity</b>	<b>Visual Quality</b>	<b>Visual Quality</b>
KOP 1	3	2	2	2.3	Low
KOP 2	3	2	2	2.3	Low
KOP 3	2	2	2	2.0	Low
KOP 4	4	3	3	3.3	Moderately low
KOP 5	2	2	2	2.0	Low

**Table 8.11-4**  
**Visual Quality at Selected Key Observation Points Following HPP Construction**

Future Case	Vividness	Intactness	Unity	Visual Quality	Visual Quality
KOP 1	3	2	2	2.3	Low
KOP 2	3	2	2	2.3	Low
KOP 3	2	2	2	2.0	Low
KOP 4	4	3	3	3.3	Moderately low
KOP 5	2	2	2	2.0	Low

Visual Quality = (Vividness + Intactness + Unity)/3

**Table 8.11-5**  
**Characteristics of Key Observation Points**

	Approximate Number of Residences	AADT <sup>1</sup>	Comments
KOP 1	15	11800	SR 98, NAS Lemoore to Avenal Cutoff
KOP 2	15	11800	SR 198, NAS Lemoore to Avenal Cutoff
KOP 3	NA <sup>2</sup>	NA	NA
KOP 4	NA	6900	SR 198, Fresno County to NAS Lemoore
KOP 5	NA	3000	25th Avenue, Avenal Cutoff to SR 198

<sup>1</sup> AADT = Annual average daily traffic (see Tables 8.10-2 and 8.10-4)

<sup>2</sup> NA = not applicable

## **Water Resources**

Technical Staff: Tony Mediati  
Technical Senior: Dick Anderson  
Project Manager: Bob Eller

## 2.12 Water Resources

### Data Adequacy Issues

#### Siting Regulations and Information

Appendix B (g) (1): ...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.

#### Information Required to Make AFC Conform with Regulations

*Please provide additional information on the water source(existing contracts), water supply and availability, chemical characteristics and volume of the discharge water, on-site treatment facilities, drainage, storage facilities and permits. Please provide more information on the disposal of the project wastewater and any mitigation measures or monitoring activities to be undertaken to ensure no adverse environmental impacts result. Please provide a discussion of the indirect and cumulative impacts associated with the operation and maintenance of the project. Please provide information on any monitoring activities needed to ensure that the project will not have adverse impacts on groundwater resources, waste treatment facilities and potential resolution in the event impacts are discovered.*

### RESPONSE 39

#### Water Source Supply and Availability

The sources of water for the HPP are the Westlands Water District (WWD) and Kings County. The property on which the HPP is to be built has an existing entitlement of 44 acre-feet of Central Valley Project (CVP) water. This water will be delivered to the HPP site by WWD through its standpipe located adjacent to the site. The WWD is in the San Luis Unit of the CVP. The main water supply features of the San Luis Unit include the Delta-Mendota Canal, the San Luis Dam and Reservoir, the San Luis Canal (SLC), and the Coalinga Canal (WWD, 2001).

The WWD's permanent distribution system consists of a closed, buried pipeline network designed to convey irrigation water to the HPP site from the SLC. Water is distributed through approximately five miles of buried pipe (Lateral 30), varying in diameter from 10 to 96 inches.

Water is supplied to Lateral 30 from the SLC. The SLC, a joint Federal/State facility, is a concrete-lined canal with a capacity ranging from 8,350 to 13,100 cfs. It is the

federally built and operated section of the California Aqueduct and extends 102.5 miles from the O'Neill Forebay, near Los Banos, in a southeasterly direction to a point west of Kettleman City. The 138-foot-wide channel is 36 feet deep, 40 feet wide at the bottom, and lined with concrete. San Luis Reservoir serves as the major storage reservoir and O'Neill Forebay acts as an equalizing basin for the upper stage dual-purpose pumping-generating plant. Pumps located at the base of O'Neill Dam take water from the Delta-Mendota Canal through an intake channel (a Federal feature) and discharge it into the O'Neill Forebay. The California Aqueduct (a State feature) flows directly into O'Neill Forebay. The pumping-generating units lift the water from the O'Neill Forebay and discharge it into the main reservoir. Water for irrigation is released into the SLC and flows by gravity to Dos Amigos Pumping Plant where it is lifted more than 100 feet to permit gravity flow to its terminus at Kettleman City (USBR, 2001).

Unlike water agencies with more abundant supplies, the WWD allocates water to its customers even in the wettest years. The WWD's annual contract entitlement from the CVP is 1,150,000 acre-feet. The annual safe yield of the confined underground aquifer adds about another 135,000 to 200,000 acre-feet. Thus, the total water available is about 15 percent (215,000 acre-feet) short of the 1,500,000 acre-feet required to water the entire irrigable area in the District (WWD, 2001).

The surface water supply is allocated to more than 535,000 acres eligible to receive CVP water. The WWD has three separate priority areas of water allocation. During periods of drought, deficiencies are applied as an equal percentage of the contract entitlement of each priority area. The WWD's water supply from 1988-2001 is illustrated in new Figure 8.14-2.

The second source of water for the HPP is Kings County. Kings County is a contractor for water from the State Water Project (SWP). SWP water is extracted from the Sacramento-San Joaquin River Delta at the Clifton Court Forebay, where it enters the California Aqueduct. SWP water is combined with CVP water in the San Luis Canal, the joint Federal/State portion of the California Aqueduct. This section of the Aqueduct passes the HPP site, approximately five miles to the west. Kings County is one of 29 SWP contractors, with access to 4,000 acre-feet of Table A water annually. However, during the current dry year of 2001, SWP contractors are only being allocated 39% of their Table A entitlement. Thus, Kings County is receiving 1,560 acre-feet of SWP water. The HPP will not receive local groundwater, and no groundwater extraction will be required for the HPP water supply. See Attachment 2-12-1 for an explanation of the HPP water allocation and exchange mechanism between Kings County and Tulare Lake Water Storage District. Attachment 2.12-2 provides a history of SWP supply.

Will-serve letters from the water supply sources were included with the AFC.

### **Chemical Characteristics and Volume of Discharge Water**

As illustrated in Figures 8.14-1a and 8.14-1b in the AFC, discharge rates from the HPP are expected to be 0.7 gallons per minute (gpm) for wastewater and 0.95 gpm for water from the oil/water separator. Based upon 8,000 hours of operation, 792,000 gallons of



wastewater per year will be generated by the HPP. In addition, approximately 500 gallons of turbine wash water drainage will be generated per event, assuming one event per month, this totals 6000 gallons per year.

Chemical and physical characteristics of the HPP wastewater are shown in new Table 8.14-4, based on annual average conditions.

### **On-Site Treatment, Drainage, Storage, and Permits**

Process wastewater and contact stormwater will be processed through the on-site oil/water separator prior to being sent to the appropriate tanks for off-site disposal. The only other wastewater treatment to occur on-site will consist of water used for domestic and sanitary purposes by HPP employees, which will be discharged to a septic tank and leach field. The septic system proposed is based on two restroom facilities and a maximum of 5 persons on-site at any time. The maximum daily sanitary flow to the septic system will be 350 gallons per day. The septic tank will be 1,500 gallons and will have a drain field of 1,000 square feet. Assuming a percolation rate of 0.5 gallons per square foot yields a drainage field requirement of 700 square feet. Based on the relatively low level of sanitary flow, the presence of clayey soils onsite, and the distance to the nearest domestic supply well, no adverse impacts to local or regional groundwater are expected.

For drainage, see Response 49.

For storage, see Response 49.

For permits, see Responses 40 and 41.

### **Wastewater Disposal**

Stormwater runoff from the immediate plant and equipment area (contact stormwater), including oil from the oil/water separator, and industrial wastewater from the plant itself would be stored in onsite holding tanks and eventually transported offsite via truck for disposal by EnVectra, a waste management company under current contract to GWF. EnVectra will provide waste management services, including the profiling of waste streams, identification of disposal sites, and verification of licenses and permits for transporters and disposal facilities. EnVectra will also arrange for the shipment and disposal of all waste streams from the HPP. EnVectra has identified the Liquid Waste Management, Inc., McKittrick Waste Treatment Site in Kern County (WMU ID# 50152041001) as the disposal point. This facility accepts RCRA, non-RCRA, and nonhazardous waste and is permitted as a Class II landfill. The facility has a capacity of 412 cubic meters (solids equivalent) per day. The slurry material from project wastewater is anticipated to constitute a small fraction of the McKittrick facility's daily capacity.

No adverse impacts to surface waters are anticipated to result from project wastewater disposal, as no discharges to surface water bodies are proposed to occur under the effluent disposal method being proposed at the HPP. The McKittrick waste disposal site is a licensed Class II facility and, as such, must comply with pertinent Regional Water Quality Control Board discharge requirements.

As additional mitigation:

- Mitigation: Process wastewater from the HPP site will be collected in the onsite holding tanks and transported via truck to the McKittrick waste disposal site in Kern County.

Proposed Verification: CEC shall be notified on an annual basis concerning status of or any changes in the HPP's wastewater disposal plan.

- Mitigation: GWF selected a contractor to haul project wastewater to the offsite disposal location. The contractor must have the appropriate permits from the U.S. Department of Transportation, the necessary equipment, and authorized admittance to the designated disposal facility. Any company not in the possession of these items will be ineligible for use at the HPP.

Proposed Verification: CEC will receive a copy of the contract conditions for the agreement between the HPP and the selected wastewater hauling company.

### **Cumulative Impacts**

According to the Kings County Planning Department, no proposed industrial or energy-related developments are planned within a two-mile radius of the HPP site (Kings County Planning Department, 2001b). Three projects are currently under review in other areas of Kings County. The first two consist of a church and an assisted living facility in Hanford, approximately 20 miles east of the HPP site. These projects would be served by the City of Hanford's domestic water service. The third project, a dairy expansion in Lemoore, approximately 6.5 miles east of the HPP site, is currently on hold pending release of the latest amendment to the dairy element of the General Plan. If eventually approved, the project would likely draw its water supply either from the City of Lemoore or local groundwater wells. None of the three projects are likely to obtain their water from Kings County or the Westlands Water District, which does not include the sites of these projects, so there would be no cumulative impact from these projects when considered in conjunction with the HPP. Cumulative impacts on local surface water and groundwater quality are not anticipated to occur since the HPP will be disposing of its wastewater at a licensed Class II disposal facility and discharging its non-contact stormwater to an onsite evaporation basin. Appropriate monitoring of the HPP's stormwater discharges will be undertaken to ensure that adverse impacts to local groundwater are prevented.

### **Monitoring Activities for Groundwater Impacts**

The HPP is not expected to have an impact on local and regional groundwater. The HPP would not directly withdraw groundwater from the area. The onsite evaporation/percolation basin would contain non-contact stormwater, and is thus not expected to contain significant concentrations of any constituents of concern. However, a stormwater

monitoring program will be established to ensure that stormwater discharges to the basin meet all applicable groundwater quality objectives.

- Mitigation: A biannual stormwater monitoring program will be implemented at the HPP site to assess the quality of stormwater discharges to the evaporation/percolation basin during two storm events, as required by the Regional Board.

Proposed Verification: CEC will receive copies of this monitoring reporting.

No adverse impacts to groundwater are anticipated to result from project wastewater disposal under the disposal method being proposed at the HPP. The McKittrick waste disposal site is a licensed Class II facility and, as such, must comply with pertinent Regional Water Quality Control Board discharge requirements for any discharges to groundwater.

#### **Siting Regulations and Information**

Appendix B (g) (14) (A) (i): Waste Discharge Requirements;

#### **Information Required to Make AFC Conform with Regulations**

*Please provide Waste Discharge Requirements.*

#### **RESPONSE 40**

Waste Discharge Requirements (WDRs) are not necessary for the HPP itself since the plant will not be discharging any waste materials to surface water bodies or groundwater. All wastewater from the plant will be hauled offsite to the McKittrick waste disposal site, as described in Response 39. The planned disposal method for noncontact stormwater (evaporation/percolation basin) also does not require WDRs as no pollutants from the site will be discharged to the basin.

#### **Siting Regulations and Information**

Appendix B (g) (14) (A) (ii): a National Pollutant Discharge Elimination System Permit.

#### **Information Required to Make AFC Conform with Regulations**

*Please provide all information required by the Regional Water Quality Control Board in a National Pollutant Discharge Elimination System Permit, or explain why this information is not needed.*

#### **RESPONSE 41**

The only NPDES permit needed for the HPP is coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activities. A

Notice of Intent (NOI) to comply with the terms of this General Permit was submitted to the State Water Resources Control Board (SWRCB) and confirmation was received on September 7, 2001. The HPP's Waste Discharge Identification number is 5F16S316468. The NOI is attached at Attachment 2.12-3.

In fulfillment of permit requirements, a Stormwater Pollution Prevention Plan (SWPPP), which will incorporate erosion control, spill control prevention, and site revegetation plans will be prepared and maintained at the project site prior to the start of construction activity. A copy of the plan will be submitted to the CEC.

No other NPDES permits are required, since facilities that do not discharge stormwater to designated "waters of the United States" do not require coverage under the General Permit for Discharges of Stormwater Associated with Industrial Activity. Because the noncontact runoff from the HPP would be discharged to an evaporation/percolation basin, the General Permit and associated monitoring and reporting requirements do not apply. No other wastes would be discharged to waters of the United States at the HPP site, so no other NPDES permits are required.

#### **Siting Regulations and Information**

Appendix B (g) (14) (B) (i): Ground water bodies and related geologic structures;

#### **Information Required to Make AFC Conform with Regulations**

*Please provide a hydrostratigraphic map at appropriate scale and the chemical characteristics of ground water bodies and related geologic structures. Please provide a discussion of the direct, indirect and cumulative impacts associated with the construction operation and maintenance of the project in relation to perched water. As well as any mitigation and monitoring plans.*

#### **RESPONSE 42**

Attachment 2.12-4 provides figures that show groundwater depth contours in the upper, unconfined aquifer and the lower, confined aquifer in the vicinity of the HPP site.

Groundwater quality data for samples taken from a well just to the north of the HPP site on the adjacent property is presented in new Table 8.14-5.

The presence of clay layers within the upper aquifer induces perched water in the area. In the vicinity of the site, perched groundwater has been located between 10 to 20 feet below ground surface in 1997 and has been found as high as 6 feet below ground surface in July 2001. If perched groundwater is encountered during site excavation and grading, any necessary dewatering will be performed. These procedures will be described in full in the SWPPP to be prepared for the project prior to the start of construction. Monitoring of site dewatering activities will be undertaken as part of the monitoring program for construction activities that will be defined in the SWPPP.

**Siting Regulations and Information**

Appendix B (g) (14) (B) (ii): Surface water bodies

**Information Required to Make AFC Conform with Regulations**

*Please provide required chemical and physical characteristics for the surface water bodies that will either receive stormwater runoff from the site or proposed linear feature and any wastewater (as disposed of by the third party hauler) from the project.*

**RESPONSE 43**

Noncontact stormwater from the HPP site will be directed to the onsite evaporation/percolation basin and will not be discharged to any surface water body. Contact stormwater from the HPP site (from maintenance and plant component and equipment areas) will be collected within holding tanks, from which it will be recycled or transported offsite by EnVectra along with plant wastewater. EnVectra will dispose of this liquid at the Liquid Waste Management's McKittrick Waste Treatment Site in Kern County, a licensed Class II disposal facility. Thus, no contact stormwater or project wastewater will be discharged to any surface water body. The natural gas pipeline interconnect will be buried, so there will not be any opportunity for stormwater runoff to come in contact with it. The pipeline interconnect will not cross any surface water body. Management practices designed to mitigate any potential pollutant loading to stormwater during construction of the pipeline interconnect will be identified in the SWPPP to be prepared for the project prior to the start of construction. Because no stormwater or wastewater will be discharged to surface waters, no chemical or physical characteristics for receiving surface waters are provided.

**Siting Regulations and Information**

Appendix B (g) (14) (C) (i): Source of the water and the rationale for its selection, and if fresh water is to be used for power plant cooling purposes, a discussion of all other potential sources and an explanation why these sources were not feasible;

**Information Required to Make AFC Conform with Regulations**

*Please provide additional information regarding the alternative water supplies discussed on page 8.14-8; explain why these sources are not feasible. This discussion should include all technical & economic factors (including cost estimates and assumptions) used in the analysis.*

**RESPONSE 44**

Four alternative process water supply alternatives were considered for the HPP. Each was rejected on the grounds described in new Table 8.14-6. Table 8.14-6 provides a comparison of the proposed HPP water supply with three alternative sources that were investigated and notes economic and technical factors in the decision to use Westlands and Kings County water deliveries.

**Siting Regulations and Information**

Appendix B (g) (14) (C) (ii): The physical and chemical characteristics of the source and discharge water;

**Information Required to Make AFC Conform with Regulations**

*Please provide the physical and chemical characteristics of the discharge water.*

**RESPONSE 45**

See Table 8.14-4 of this section for the chemical characteristics of the facility wastewater.

**Siting Regulations and Information**

Appendix B (g) (14) (C) (iii): Average and maximum daily and annual water demand and waste water discharge for both the construction and operation phases of the project

**Information Required to Make AFC Conform with Regulations**

*Please provide information on the average and maximum daily water demand and wastewater discharge for construction phases of the project. Please provide information on the wastewater discharge for the operational phases of the project.*

**RESPONSE 46**

Maximum daily water use for HPP construction activities will occur during site grading and excavation, expected to take place over a 3-month period. Most of this water will be used for fugitive dust control. The maximum daily use is expected to be approximately 12,000 gallons, with the daily average estimated at approximately 2,000 gallons.

Additional water will be required for the flushing and commissioning of water treatment systems. It is estimated that this activity will take place over a five-day period, with the peak/average daily water use for this activity estimated at 2,000 gallons. Wastewater from this activity will be discharged to an onsite holding tank for transport offsite, an arrangement that will also be used for (and is fully described in association with) plant wastewater and contact stormwater runoff. Wastewater volumes associated with this activity are expected to be generally equivalent to the water used for the process.

The water-balance diagrams for the HPP are presented in Figures 8.14-1a and 8.14-1b of the AFC. The expected flow rates of the wastewater streams for both average annual ambient temperature (63°F) and maximum daily ambient temperature (98°F) are provided. As illustrated, the primary wastewater discharge for the plant is from the water reverse osmosis treatment and demineralization systems. This wastewater stream will be collected in a storage tank and then processed through the use of a mechanical vapor re-compression unit to separate the concentrated dissolved solids from the wastewater stream. Clean water will be returned to the raw water holding tank and the small amount of concentrated slurry discharge will be stored in a wastewater tank and periodically transported offsite for disposal, as described above. Waste

streams from the oil/water separator and turbine wash-water will be collected in separate holding tanks and will also be periodically transported offsite for disposal.

### **Siting Regulations and Information**

Appendix B (g) (14) (C) (iv): A description of all facilities to be used in water conveyance, treatment, and discharge. Include a water mass balance diagram.

### **Information Required to Make AFC Conform with Regulations**

*Please provide a description of all facilities to be used in water conveyance, treatment, and discharge*

### **RESPONSE 47**

For a description of the facilities to be used to convey HPP process water to the site, see Response 39. For a description of the facilities to be used to convey water through the HPP itself, see below and the mass balance diagrams in Figures 8.14-1a and 8.14-1b in the AFC. For a description of the facilities to be used to convey noncontact stormwater on the site, see Response 48.

The HPP's simple-cycle unit does not include a cooling tower and will therefore have a minimal water demand. The average annual water consumption for the HPP, assuming 8,000 hours of operation, will be approximately 150 acre-feet per year. The HPP average daily flow rate is 148,000 gallons per day. Purified water will be used by the combustion turbine generators (CTG's) for evaporative cooling (for power augmentation), emissions control (water injection for control of nitrogen oxides), and turbine compressor washing.

The treatment process of raw water to create purified water for consumption by each CTG is will be accomplished by the following method:

Raw water from the California Aqueduct will be delivered by the Westlands Water District and will be stored on site in a 300,000-gallon carbon steel internally lined tank (raw water storage tank). This tank will also feed the fire water system and plant service water needs in addition to providing process water used by the CTG's. CTG water will be pumped from the tank to the multi-stage reverse osmosis (RO) system, where the water will be initially pre-filtered to remove suspended solids, and softened to remove hardness for the water. This initial water softening step prevents scale buildup downstream in the RO membranes. The first stage of the RO unit produces nearly pure water known as RO Permeate that contains a total dissolved solids (TDS) concentration of approximately 1 ppm. The by-product of the RO known as RO Reject is water that has an elevated concentration of TDS.

The first stage RO permeate is sent to the Electro-Deionization Unit (EDI) where it is purified so that the TDS is reduced to a less than a measurable amount. The water flows through cells in the EDI that contain a DC electrical potential, which results in the removal of almost all of the remaining ions. The demineralized water (pure water) produced in the EDI is then stored in a 300,000 gallon stainless steel tank for use in the CTG's.

The RO reject from the first stage is sent to a second stage RO unit where the process is again repeated and both RO Permeate and RO Reject streams are produced. The RO Permeate from this second stage unit is sent to the EDI for further purification and then to storage in the “pure water” tank. The RO Reject is sent to a 150,000-gallon stainless steel RO Reject storage tank. EDI wash water needed to maintain the DC cell integrity is also sent to the RO Reject storage tank.

The RO Reject in the storage tank is further processed by using a Mechanical Vapor Re-compression Unit to remove available water that can be reused in the plant as make-up water. RO reject is fed from the storage tank into a vertical vessel or flash tank. A 450 kW mechanical vapor re-compressor reduces the pressure in the vessel causing the RO Reject water to boil. The boiled water vapor is then sent to a heat exchanger where it is condensed back to a liquid and pumped back to the raw water storage tank for reuse. The remaining liquid slurry in the vertical vessel is continually being concentrated and is blown down or transferred to an 8,000 gallon stainless steel wastewater holding tank when the total dissolved solids (TDS) concentration has reached approximately 37,000 mg/L. The concentrated blow-down is stored in the wastewater holding tank until it is trucked off-site for disposal.

### **Siting Regulations and Information**

Appendix B (g) (14) (D) (i): Precipitation and storm runoff patterns;

### **Information Required to Make AFC Conform with Regulations**

*Please provide information on stormwater runoff patterns at and around the site.*

### **RESPONSE 48**

Elevations on site range from 222.0 feet in the southeastern corner to 225.0 ft in the northwestern corner. The terrain is essentially flat with the steepest grade across the site being approximately 0.14% from the southeastern corner to the northwestern corner. See Attachment 2.12-5 for a diagrammatic description of existing flow patterns. There is an existing ditch along 25th Avenue and along the northern property line approximately 18 inches deep. No major surface water drainages are present on the site. Stormwater runoff currently runs by sheet flow across the site toward the southeast and likely continues off of the HPP site and onto the adjacent property during major storm events. This is most likely a rare occurrence due to both the infrequent nature of rainfall in the area and the extremely level nature of the terrain. In addition, intervening features (cultivated farm fields) likely encourage infiltration by slowing flow velocities in all but the most extreme storm events.

The presence of the drainage ditches along the western and northern (upslope) boundaries of the site means that offsite runoff from upslope areas is prevented from flowing onto the HPP site. Thus, the majority of the stormwater crossing the HPP site is runoff generated by rain falling on the site itself, as opposed to surrounding properties.

Grading during construction of the HPP would alter existing drainage patterns on the site. Surface water runoff would be directed around the construction site to the maximum extent feasible to minimize excess erosion and pollutant loading. It is anticipated that the



remainder of the site will continue to be used for agricultural production. See also AFC Appendix H1-2. The stormwater runoff generated from all storms up to and including the 10-year, 10-day event will be captured by the site's drainage system and either routed to the onsite evaporation/percolation basin or to an onsite holding tank for eventual recycling or offsite disposal via truck, depending on the portion of the site it comes from.

Post-construction runoff from the project will be managed with the use of trench drains, shallow ditches, and CHDPE storm piping systems. All of the stormwater runoff will be collected into a large, shallow retention pond to the east of the power block that will rely on percolation and evaporation for drainage. The volume of the pond will be determined based on a 10-year, 10-day storm event (4-inch rainfall) as required by the Kings County Public Works Improvement Standards for Private Retention Basins. A preliminary calculation of the pond's volume has been completed and is included in Attachment 2.12-6. This calculation will be re-evaluated following completion of additional geotechnical study to determine the water table elevation under the pond site. Peak flows for storm pipes and culverts will be calculated using the Rational Method based on a 25-year, 24-hour design storm and will be designed using Manning's Equations.

The area north of the main transformer including the administration building and parking and the switchyard will drain to the north to a series of catch basins along the northern loop road. This area will include the northern loop road that will be super elevated to drain towards the catch basins. The runoff will be collected in the catch basins then carried to the retention basin by HDPE pipes.

The area south of the administration parking and the area within the main loop road that includes the turbines will be crowned in the middle so that runoff will flow to the north to a series of catch basins and to the south to a trench drain. The runoff that will be collected in the catch basins will be carried to the retention basin by HDPE pipes. The runoff collected in the trench drain will be carried to a catch basin south of the turbines and carried to the retention pond by HDPE pipes. The southern portion of the loop road will be super elevated to drain towards the trench drain. The entire area east of the easternmost unit will sheet flow over the super elevated loop road to the east into the retention basin.

Specific design criteria for collection and discharge points, drains, and culverts will be included in the SWPPP to be prepared prior to the start of construction. Best management practices to be put in place prior to and during the construction phase will be identified and shown on the final construction drawings and will be fully detailed in the SWPPP to be prepared prior to the start of construction.

**Siting Regulations and Information**

Appendix B (g) (14) (D) (ii): Drainage facilities and design criteria;

**Information Required to Make AFC Conform with Regulations**

*Please describe the stormwater collection system (including capacity) proposed for construction and operation. Please include design criteria and calculations and expected peak flow volumes for the various facilities.*

**RESPONSE 49**

For information on the stormwater collection system see Response 48.

**Siting Regulations and Information**

Appendix B (g) (14) (E) (i): The effects of project demand on the water supply and other users of this source;

**Information Required to Make AFC Conform with Regulations**

*Please provide information regarding the source and current use of the water. Discuss the potential for water curtailment.*

**RESPONSE 50**

For a discussion of the source and current use of the project's water see Response 39. The total of 244 acre-feet of water that will be available to the HPP will provide 94 acre-feet beyond the project's anticipated peak needs. This additional supply is necessary as a cushion to guard against mandated cutbacks in supply to CVP and SWP contractors during dry years such as 2001. With this additional supply the HPP will have adequate water to meet its operational requirements, even during periods of water supply containment.

Although historical CVP and SWP delivery practices indicate that it is unlikely that the HPP would ever be impacted by a water supply curtailment, this cannot be guaranteed. GWF has SWP surface water rights that substantially exceed HPP requirements, and there is a significant margin to ensure the reliability of this supply. This margin allows GWF to assume the remote business risk that this supply would potentially be interrupted due to curtailment. In the unlikely event that water curtailment were to impact the availability of water to the HPP, GWF would either discontinue evaporative cooling or discontinue operation of the plant (if the water supply fell below the level needed for NO<sub>x</sub> control). GWF has no plans to develop local groundwater supply for the project as a backup supply.

**Siting Regulations and Information**

Appendix B (g) (14) (E) (ii): The effects of construction activities and plant operation on water quality;

**Information Required to Make AFC Conform with Regulations**

*Please provide information on the criteria to be used in the selection of the wastewater hauler and the ultimate disposal facility. Please provide information on the potential effects of the project's effluent on the disposal facility. Please clarify if water from the oil-water separator is going to be reused or disposed of offsite.*

#### **RESPONSE 51**

For a discussion of the criteria to be used in selecting the wastewater hauler and disposal facility, see Response 39.

Water from the oil-water separator will go to a holding tank for recycle within the plant or offsite disposal via the wastewater hauler.

#### **SB 28 Sher Requirements and Information**

§25552(e)(1) (All): [a]ssure that the thermal powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;

#### **Information Required to Make AFC Conform with Regulations**

*For mitigated measures stated, please provide proposed verification measures to ensure that the powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation. If creeks, sloughs or drainages are crossed, please provide a description of the proposed conditions of certification that will ensure the construction of linear facilities will not have a significant adverse effect on the environment.*

#### **RESPONSE 52**

#### **Proposed Verification for Mitigation Measures**

- Minimizing soil erosion through best management practices

Verification: See Conditions of Certification Soil and Water 1, and its Verification (submission of Stormwater Pollution Prevention Plan to CEC), and Condition of Certification Soil and Water 2 and its Verification (submission of erosion control plan to CEC).

- Management of contact stormwater

Verification: The project owner/operator will keep records detailing pick-up for off-site disposal of oil produced from the oil-water separator.

- Spill contingency

Verification: Prior to initiation of construction, the project owner/operator will make available copies of the spill contingency plan to the CEC.

Note that verifications have been proposed for each of the additional mitigation measures proposed in Response 39.

**Surface Water Crossings**

No surface water features are to be crossed by either the any of the HPP linear features; therefore, no conditions of certification pertaining to this issue are necessary.

No surface water features are to be crossed by any components of the HPP project.

**SB 28 Sher Requirements and Information**

§25552(e)(3) (All): [r]esult in compliance with all applicable federal, state, and local laws, ordinances, and standards;

**Information Required to Make AFC Conform with Regulations**

*If creeks, sloughs or drainages are crossed, please provide information on laws, regulations, ordinances, standards or permits that may be required.*

**RESPONSE 53**

No surface water features are to be crossed by any components of the HPP project.

**New Tables for  
Section 8.14 (Water Resources)**

**Table 8.14-4**  
**Chemical Characteristics of HPP Wastewater Discharges**

<b>Constituent</b>	<b>Concentration (mg/L unless otherwise indicated)</b>
Calcium	2,934.0
Antimony	0.73
Hardness	13,936.5
Alkalinity	10,415.7
Total Dissolved Solids	37,115.0
Specific Conductance	60,147 micromhos/cm
Sulfate	4,841.1
Chloride	8,215.2
Arsenic	0.29
Beryllium	0.147
Boron	29.34
Fluoride	1.47
Chromium	0.88
Copper	0.29
Iron	6.89
Lead	0.147
Selenium	not reported
Magnesium	1,613.7
Manganese	0.734
Turbidity	1,496 (NTU)
Phosphorus- Total	17.60
Phosphorus-Ortho	11.74
Sodium	6,308.1
Zinc	0.73
Bromide	23.47
Nitrite+Nitrate	98.82 (as N)

**Table 8.14-5**  
**Local Groundwater Quality Data**

<b>Constituent</b>	<b>Total Concentration (ppm)</b>
Aluminum	<0.1
Barium	<0.1
Boron	1.9
Cadmium	<0.01
Calcium	90
Calculated Hardness (CaCO <sub>3</sub> )	96
Chromium	<0.01
Copper	<0.01
Iron	0.06
Lead	<0.1
Lithium	0.01
Magnesium	5.9
Manganese	0.04
Molybdenum	<0.1
Nickel	<0.1
Phosphorus	0.5
Potassium	1.7
Silica	41
Sodium	570
Strontium	0.22
Vanadium	<0.01
Zinc	<0.01
Bromide	<3.0
Nitrite	<3.0
Chloride	99
Nitrate	<2.4
Sulfate	96
Bicarbonate	400
Carbonate	37
Methyl Orange	440
Phenolphthalein	19
pH	8.5 pH units
Conductivity	1200 mmhos/cm
Total Dissolved Solids	740

Source: Analytical Resources, sampled from Henrietta Well #3, 6/8/01.

Table 8.14-6

## Henrietta Peaker Plant Project - Water Source Alternatives Cost Evaluation

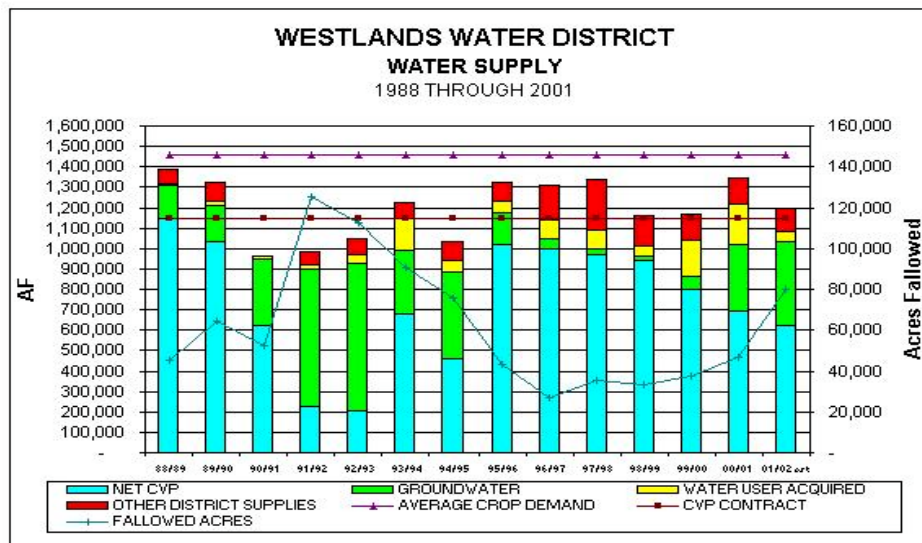
Water Supply Source	Estimated Cost of Supply	Estimated Cost of Water Treatment Equipment	Total Estimated Cost of Supply & Water Equip.	Cost Difference From the Proposed System	System Requirements	Assumptions/Comments
SWP and CVP Surface Water from the California Aqueduct (Proposed)	\$0.1 Million	\$3.7 Million	\$3.8 Million		16.5 feet of 8" underground piping to connect the project site to the existing Westland's Water District Supply line.	Aqueduct water total dissolved solids (TDS) level is approximately 250 ppm resulting in the need for the minimum capacity water processing system and a process waste water stream that is the lowest of the four water sources considered.
On site Drilled Well (Alternative)	\$0.6 Million	\$5.5 Million	\$6.1 Million	\$2.3 Million	Drill on-site well to a minimum depth of 600 feet.	On-site well will impact local ground water withdrawal. The TDS of well water is approximately 650 ppm which will require a water treatment system with a greater capacity to process water from the ground water supply source.
NAS Lemoore Effluent Ponds (Alternative)	\$1.3 Million	\$5.5 Million	\$6.8 Million	\$3.0 Million	2 miles of underground piping to connect the project site to the local industry discharge ponds.	TDS of water from NAS Lemoore Ponds is approximately 750 ppm. The water also contains suspended solids and BOD, which would require pretreatment prior to use at the HPP. This source of water would require a treatment system with a much greater capacity to process water from the ground water supply source.
Waste Water from Local Industrial Facilities (Alternative)	\$4.5 Million	\$6.4 Million	\$10.9 Million	\$6.1 Million	9 miles of underground piping to connect the project site to the NAS Lemoore effluent ponds.	TDS of water from local industry is approximately 1,250 ppm. This water supply alternative contains suspended solids and significant concentrations of BOD, which would require pretreatment prior to use at the HPP. Because of the high TDS the use of this water supply would require water treatment equipment with a much higher design capacity.





**New Figures for  
Section 8.14 (Water Resources)**

Figure 8.14-2



Source: WWD, 2001

**Attachment 2.12-1**

**HPP Water Allocation and Exchange Mechanism**

**Between Kings County and Tulare Lake Water Storage District**

**Attachment 2.12-2**

**History of SWP Supply**

**Attachment 2.12-3**

**Notice of Intent**

**Attachment 2.12-4**

**Generalized Depth to Groundwater in Upper Zone and Generalized Depth to Sub-Corcoran Piezometric Groundwater Surface**

**Attachment 2.12-5**  
**Existing Property Gradient**



**Attachment 2.12-6**

**Stormwater Drainage Summary, Stormwater Calculations,  
and Retention Pond Volume**

